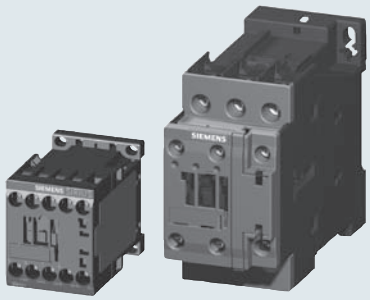
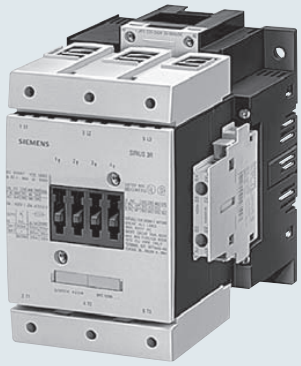
contents

contents

Contactors for switching three-phase motors



3RT20 contactors, 3-pole
3 to 75 HP, Sizes S00 to S3
with screw, spring or ring lug connections

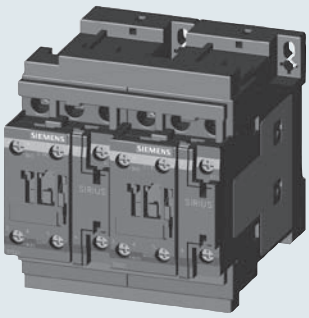


3RT10 contactors, 3-pole,
100 to 400 HP,
sizes S6, S10 and S12

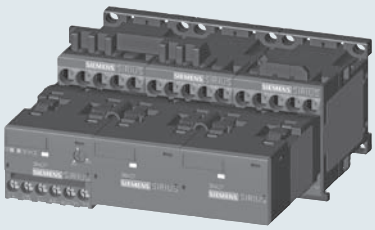
3RT20 NEMA
labeled contactors,
NEMA size 0 to 6

Contactor assemblies for switching three-phase motors

3RT12 vacuum contactors, 3-pole,
150 to 400 HP,
sizes S10 and S12



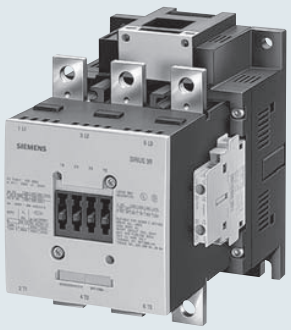
3RA13 / 23 contactor assemblies for reversing, 3 to 75 HP, sizes S00 to S3
with screw or spring loaded connections



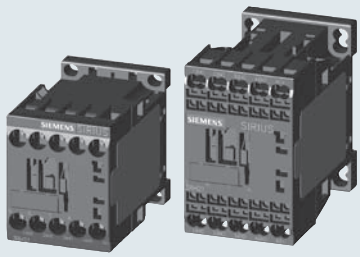
Wye Delta for
customer assembly of
sizes S00 to S12

contents

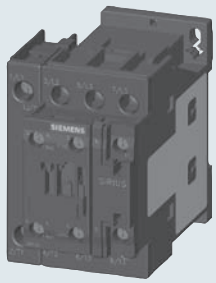
Contactors for special applications



3RT14 / 24 contactors, I_e/AC-1: 140 to 690 A, 3-pole, sizes S3 to S12,
with screw connections

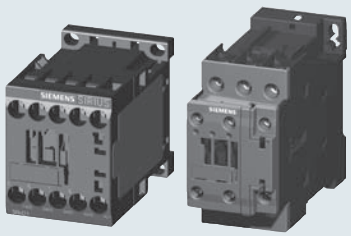


3RT23 contactors, AC-1: 18 to 140 A with 4 NO main contacts, sizes S00 to S3
with screw or spring connections

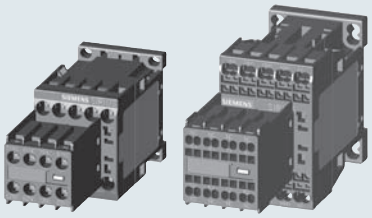


3RT25 contactors, AC-3: 7.5-25 HP with 2 NO + 2 NC main contacts, sizes S00 to S2
with screw or spring connections

3RT26 capacitor contactors, up to 75 kvar, sizes S00 to S2
with screw connections



3RT20 coupling relays up to 20 HP (interface,) 3-pole, for switching motors, sizes S00 and S0
with screw or spring connections

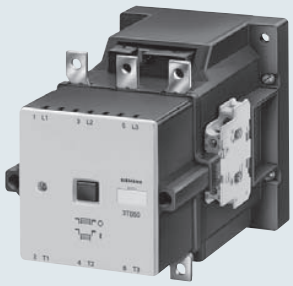


3RT Safety Contactors and 3RH Safety Control Relays

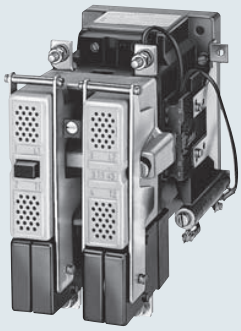
contents

Contactors for special applications

3TF68 and 3TF69 vacuum contactors, 500 to 700 HP; contactor assemblies



3TB50 to 3TB56 contactors with DC solenoid system, 100 to 300 HP



3TC Contactors

3RT1 SIRIUS Nomenclature

3RT1	0	3	5	1	A	B0	1
SIRIUS Contactor	**Application** 0 = 3 pole Standard 2 = 3 pole Vacuum 3 = 4 pole NO 4 = 3 pole resistive load 5 = 4 pole 2 NO + 2 NC 6 = 3 pole Capacitive	**Frame** 5 = S6 6 = S10 7 = S12	**Current** Designation Choices = 4,5,6	**Terminal** 2 = Spring Loaded Coil only 6 = Busbar Terminal	**Coil Type** A = AC/DC (S6-S12) N = UC Solid state (S6-S12) P = UC Solid state with RLT (S6-S12)	**Coil Voltage** See Coil Selection Chart page 2/51	**Aux Contacts A)** 0 = None 4 = 2NO + 2NC (S6-S12) 5 = 1NO + 1 NC (S6-S12) 6 = 2 NO + 2 NC (S6-S12) A) per EN50012

3RT2 SIRIUS Innovations Nomenclature

3RT2	0	1	5	1	A	B0	1
SIRIUS Innovations Contactor	**Application** 0 = 3 pole Standard 3 = 4 pole NO 5 = 4 pole 2 NO + 2 NC 6 = 3-pole Capacitive	**Frame** 1 = S00 2 = S0 3 = S2 4 = S3	**Current** 3,4,5,6,7,8	**Terminal** 1 = Screw 2 = Spring Loaded 3 = Spring Loaded Coil only 4 = Ring Lug	**Coil Type** A = AC (S0-S3) B = DC N = UC Electronic	**Coil Voltage** See Coil Selection Chart page 2/51	**Aux Contacts A)** 0 = 1NO + 1NC (S0-S3) 1 = 1 NO (S00) 2 = 1 NC (S00) 4 = 2NO + 2NC (S00-S3) A) per EN50012

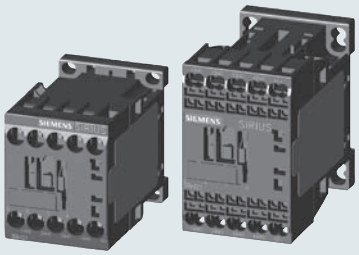
Note: MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module or can be purchased pre-assembled as 3RA starter assemblies. See section 4.

Note: Contactors and Overloads of the frame size S00 - S3 are made to easily fit together without the use of accessories.

Note: This is only a guide to decode the model number. All possible combinations of these are not available.

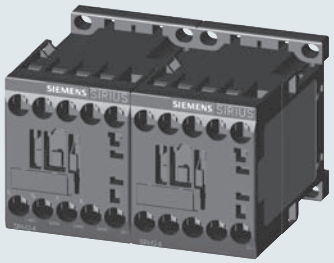
Contents

SIRIUS contactor relays



3RH21, 3RH22 control relays 4- and 8-pole, size S00, AC/DC operation Page

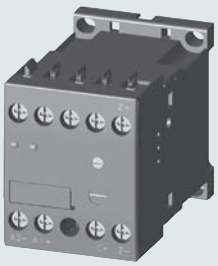
Selection and ordering data



3RH24 latched control relays, 4-pole, size S00, AC/DC operation Page

Selection and ordering data

SIRIUS coupling relays (interface)



3RH21 coupling relays for switching auxiliary circuits, 4-pole, size S00, DC operation Page

Selection and ordering data

SIRIUS current monitoring relays

3RR current monitoring relays for direct mounting to SIRIUS contactors Page

Selection and ordering data

Type		S00 3RT20 1				S0 3RT20 2						S2 3RT20 3			
3RT20 contactors															
Type		3RT2015	3RT2016	3RT2017	3RT2018	3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028	3RT2035	3RT2036	3RT2037	3RT2038
AC/DC operation		(p. 2/8)				(p. 2/8)						(p. 2/8)			
Type															
AC/DC operation															
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)															
200 V	HP	1.5	2	3	3	2	3	5	7.5	10	10	10	15	20	20
230 V	HP	2	3	3	5	3	3	5	7.5	10	10	15	15	20	25
460 V	**HP**	**3**	**5**	**7.5**	**10**	**5**	**7.5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**50**
575 V	HP	5	7.5	10	10	7.5	10	15	20	25	25	40	50	50	60
AC-3															
I_e/AC-3/400V	A	6	9	12	16	9	12	17	25	32	38	40	50	65	80
230 V	kW	1.5	2.2	3	4	2.2	3	4	5.5	7.5	11	11	15	18.5	22
400 V	**kW**	**3**	**4**	**5.5**	**7.5**	**4**	**5.5**	**7.5**	**11**	**15**	**18.5**	**18.5**	**22**	**30**	**37**
500 V	kW	3.5	4.5	5.5	7.5	4.5	7.5	10	11	18.5	18.5	22	30	37	37
690 V	kW	4	5.5	5.5	7.5	7.5	7.5	11	11	18.5	18.5	22	22	37	45
1000 V	kW	—	—	—	—	—	—	—	—	—	—	—	—	—	—
AC-4 (at I_a = 6 x I_e)															
400 V	**kW**	**3**	**4**	**4**	**5.5**	**4**	**5.5**	**7.5**	**7.5**	**11**	**11**	**18.5**	**22**	**30**	**37**
400 V (200,000 operating cycles)	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6	11.6	12.6	14.7	15.8
AC-1 (40°C, ≤ 690V)															
I_e	**A**	**18**	**22**	**22**	**22**	**40**	**40**	**40**	**40**	**50**	**50**	**60**	**70**	**80**	**90**

Accessories for contactors				
Auxiliary switch blocks	front	**3RH29 11** (p. 2/68)	**3RH29 11** (p. 2/68)	
	lateral	**3RH29 11** (p. 2/70)	**3RH29 21** (p. 2/70)	
Terminal covers		—	—	**3RT29 36** (p. 2/79)
Box terminals		—	—	—
Surge suppressor		**3RT29 16** (p. 2/75)	**3RT29 26** (p. 2/75)	**3RT29 36** (p. 2/75)
3RU21 and 3RB3 overload relays (Section 3)				
3RU21, thermal, CLASS 10		**3RU21 16** 0.1-16A (p. 3/10)	**3RU21 26** 0.18-40A (p. 3/10)	**3RU21 36** 11-80A (p. 3/10)
3RB30/31, solid-state, CLASS 5, 10, 20 and 30		**3RB30 16** 0.1-16A (p. 3/22) **3RB31 13** (p. 3/23)	**3RB30 26** 0.1-40A (p. 3/22) **3RB31 23** (p. 3/23)	**3RB30 36** 12-80A (p. 3/22) **3RB31 33** (p. 3/23)
3RB22/23, solid-state, CLASS 5, 10, 20 and 30		**3RB2.83+** 0.3-25A (p. 3/34) **3RB29 06**		**3RB22,** 10-100A (p. 3/34) **3RB22, 3RB23** and **3RB24** with current measuring module
3RV20 circuit-breakers (Section 1)				
Type		**3RV20 11** 0.18-16A (p. 1/4)	**3RV20 21** 11-40A (p. 1/4)	**3RV20 31** 9.5-80A (p. 1/5)
Link modules		**3RA29 11** (p. 1/10)	**3RA29 21** (p. 1/10)	**3RA29 31** (p. 1/10)

3RA23 Reversing contractor assemblies															
Complete units	**Type**	**3RA2315**	**3RA2316**	**3RA2317**	**3RA2318**	**3RA2324**	**3RA2325**	**3RA2326**	**3RA2327**	**3RA2328**	**3RA2335**	**3RA2336**	**3RA2337**	**3RA2338**
		(page 2/42)				(page 2/44)					(page 2/45)			
460 V	**HP**	**3**	**5**	**7.5**	**10**	**7.5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**50**
Installation kits / wiring connectors		**3RA2913-2AA1 (p. 2/83)**				**3RA2923-2AA1 (p. 2/83)**					**3RA2933-2AA1 (p. 2/83)**			
Mechanical interlocks		**3RA2912-2H (p. 2/84)**				**3RA2922-2H (p. 2/84)**					**3RA2934-2B (p. 2/82)**			





Type		S3 3RT2. 4			S6 3RT1. 5			S10 3RT1. 6			S12 3RT1. 7		S14 3TF6	
3RT20 contactors														
Type		**3RT2045** (p. 2/8)	**3RT2046**	**3RT2047**	**3RT1054** (p. 2/11)	**3RT1055**	**3RT1056**	**3RT1064** (p. 2/11)	**3RT1065**	**3RT1066**	**3RT1075** (p. 2/11)	**3RT1076**	—	—
AC/DC operation														
Type								**3RT1264** (p. 2/12)	**3RT1265**	**3RT1266**	**3RT1275** (p. 2/12)	**3RT1276**	**3TF68** (p. 2/55)	**3TF69**
AC/DC operation														
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)														
200 V	HP	25	30	30	40	50	60	60	75	100	125	150	200	290
230 V	HP	30	30	40	50	60	75	75	100	125	150	200	250	350
460 V	**HP**	**60**	**75**	**75**	**100**	**125**	**150**	**150**	**200**	**250**	**300**	**400**	**500**	**700**
575 V	HP	60	75	100	125	150	200	200	250	300	400	500	650	860
AC-3														
I_e/AC-3/400V	A	80	95	110	115	150	185	225	265	300	400	500	630	820
230 V	kW	22	22	30	37	45	55	55	75	90	132	160	200	260
400 V	**kW**	**37**	**45**	**55**	**55**	**75**	**90**	**110**	**132**	**160**	**200**	**250**	**335**	**450**
500 V	kW	45	55	75	75	90	110	160	160	200	250	355	434	600
690 V	kW	55	75	90	110	132	160	200	250	250	400	400/500	600	800
1000 V	kW	37	—	—	75	90	90	90/315	132/355	132/400	250/560	250/710	600	800
AC-4 (at I_a = 6 x I_e)														
400 V	**kW**	**37**	**45**	**55**	**55**	**75**	**90**	**110**	**132**	**160**	**200**	**250**	**355**	**400**
400 V (200,000 operating cycles)	kW	17.9	22	24.3	29	38	45	54/78	66/93	71/112	84/140	98/161	168	191
AC-1 (40°C, ≤ 690V)														
I_e	A	**125**	**130**	**130**	**160**	**185**	**215**	**275/330**	**330**	**330**	**430/610**	**610**	**700**	**910**

Accessories for contactors					
Auxiliary switch blocks front	**3RH29 11** (p. 2/68)	**3RH19 21** (p. 2/68)			—
lateral	**3RH29 21** (p. 2/70)	**3RH19 21** (p. 2/70)			**3TY7 561** (p. 2/55)
Terminal covers	**3RT2946-4EA2** (p. 2/81)	**3RT19 56-4EA1/2/3** (p. 2/81)	**3RT19 66-4EA1/2/3** (p. 2/81)		**3TX7 686/696** (p. 2/56)
Box terminals	—	**3RT19 55/56-4G** (p. 2/81)	**3RT19 66-4G** (p. 2/81)		—
Surge suppressor	**3RT29 36** (p. 2/75)	**3RT19 56-1C** (RC element) (p. 2/75)			**3TX7 572** (p. 2/56)
3RU21 and 3RB3 overload relays (Section 3)					
3RU21, thermal, CLASS 10	**3RU21 46** 18-100A (p. 3/10)	—	—	—	—
3RB30/31, solid-state, CLASS 5, 10, 20 and 30	**3RB30 46** 12.5-100A (p. 3/22) **3RB31 43** (p. 3/23)	**3RB20 56** 50–200A (p. 3/22) **3RB21 56** (p. 3/23)	**3RB20 66** 50–630A (p. 3/22) **3RB21 66** (p. 3/23)	**3RB20 66** 160–630A **3RB21 66** (p. 3/22)	**3RB20 66** 160–630A **3RB21 66** (p. 3/22)
3RB22/23, solid-state, CLASS 5, 10, 20 and 30		**3RB2.83 +** 20–200A (p. 3/34) **3RB29 56**	**3RB2.83 +** 63–640A (p. 3/34) **3RB29 56**		
3RV20 circuit-breakers (Section 1)					
Type	**3RV20 41** 45-100A (p. 1/5)	—	—	—	—
Link modules	**3RA19 41** (p. 1/10)	—	—	—	—

3RA23 Reversing contractor assemblies														
Complete units	**Type**	**3RA23 45** (p. 2/46)	**3RA23 46**	**3RA23 47**	—			—			—		—	
460 V	**HP**	**60**	**75**	**75**	**100**	**125**	**150**	**150**	**200**	**250**	**300**	**400**	**500**	**700**
Installation kits / wiring connectors		**3RA2943-2AA1** (p. 2/83)			**3RA1953-2A** (p. 2/83)			**3RA1963-2A** (p. 2/83)			**3RA1973-2A** (p. 2/83)		**3TX7680-1A**	
Mechanical interlocks		**3RA2934-2B**			**3RA1954-2A** (p. 2/82)								**3TX7686-1A**	

Selection and ordering data


3RT201.-1A


3RT201. -2A. . .


3RT2028-1N...


3RT2025-2B...


3RT2035-1A...


3RT2045-1A...

Frame Size	Amp Ratings AC3	AC1	Single-phase HP ratings 115V	208V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals Order No.	Spring-Loaded Terminals[1] Order No.	Weight approx. kg
3RT 3-pole contactors														
S00	**6**	18	0.25	0.5	0.75	1.5	2	**3**	5	1	0	**3RT2015-1□●●1**	**3RT2015-2□●●1**	0.24/0.29
										0	1	**3RT2015-1□●●2**	**3RT2015-2□●●2**	
	9	22	0.33	1	1	2	3	**5**	7.5	1	0	**3RT2016-1□●●1**	**3RT2016-2□●●1**	
										0	1	**3RT2016-1□●●2**	**3RT2016-2□●●2**	
	12	22	0.5	1.5	2	3	3	**7.5**	10	1	0	**3RT2017-1□●●1**	**3RT2017-2□●●1**	
										0	1	**3RT2017-1□●●2**	**3RT2017-2□●●2**	
	16	22	1	2	2	3	5	**10**	10	1	0	**3RT2018-1□●●1**	**3RT2018-2□●●1**	
										0	1	**3RT2018-1□●●2**	**3RT2018-2□●●2**	
S0	**9**	40	1	1	1	2	3	**5**	7.5	1	1	**3RT2023-1□●●0**	**3RT2023-2□●●0**	0.42/0.60
	12	40	1	2	2	3	3	**7.5**	10	1	1	**3RT2024-1□●●0**	**3RT2024-2□●●0**	
	17	40	1	2	3	5	5	**10**	15	1	1	**3RT2025-1□●●0**	**3RT2025-2□●●0**	
	25	40	2	3	3	7.5	7.5	**15**	20	1	1	**3RT2026-1□●●0**	**3RT2026-2□●●0**	
	32	50	2	5	5	10	10	**20**	25	1	1	**3RT2027-1□●●0**	**3RT2027-2□●●0**	
	38	50	3	5	5	10	10	**25**	25	1	1	**3RT2028-1□●●0**	**3RT2028-2□●●0**	
S2	**40**	60	3	5	7.5	10	15	**30**	40	1	1	**3RT2035-1□●●0**	**3RT2035-3□●●0**	0.99/1.121
	50	70	3	7.5	10	15	15	**40**	50	1	1	**3RT2036-1□●●0**	**3RT2036-3□●●0**	
	65	80	5	10	10	20	20	**50**	50	1	1	**3RT2037-1□●●0**	**3RT2037-3□●●0**	
	80[2]	90	5	10	15	20	25	**50**	60	1	1	**3RT2038-1□●●0**	**3RT2038-3□●●0**	
S3	**80**	125	7.5	10	15	25	30	**60**	60	1	1	**3RT2045-1□●●0**	**3RT2045-3□●●0**	1.8/2.8
	95	130	10	10	20	30	30	**75**	75	1	1	**3RT2046-1□●●0**	**3RT2046-3□●●0**	
	110	130	10	10	20	30	40	**75**	100	1	1	**3RT2047-1□●●0**	**3RT2047-3□●●0**	
												□	**□**	
	Size S2 & S3 only: Replace "B" with "K" for 24VDC coil only **Size S0-S3 only: UC Electronic with integrated varistor**											**AC Coil = A** **DC Coil = B** **UC Coil = N**	**A** **B** **N**	

NEMA SIze	Amp Ratings	Single-phase HP ratings 115V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals with AC coil Order No.	Screw Terminals with 24 VDC coil Order No.	Weight approx. kg
NEMA Labeled Contactors												
0	**18**	1	2	3	3	**5**	5	1	0	**3RT2018-1A●●1-0UA0**	**3RT2018-1BB41-0UA0**	0.28
1	**27**	2	3	7.5	7.5	**10**	10	1	1	**3RT2027-1A●●0-0UA0**	**3RT2027-1BB40-0UA0**	0.42
2	**45**	3	7.5	10	15	**25**	25	1	1	**3RT2036-1A●●0-0UA0**	**3RT2036-1NB30-0UA0**	0.986/1.121
3	**90**	7.5	15	25	30	**50**	50	1	1	**3RT2046-1A●●0-0UA0**	**3RT2046-1NB30-0UA0**	1.8 / 2.8

Note: Ring lug terminals are also available in size S00 & S0 contactors, except contactors with communication interface or UC coil. Change the 8th digit of the order number to a "4", e. g. 3RT2015-4AK61.

For further coil voltages, see page 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/123-2/144.
For description, see page 2/106-2/107.
For int. circuit diagrams, see page 2/192-2/199.
For dimension drawings, see page 2/211-2/214.

AC Coil Selection for 3RT201 through 3RT204

●●Coil Code	C2[3]	H2[4]	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	—	—	—

DC Coil Selection for 3RT201 & 3RT202 (for 3RT203 & 3RT204 see UC)

●●Coil Code	A4[5]	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3[5]
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT203 & 3RT204

●●	B3	F3	P3[6]
	20-33V	83-155V	175-280V

[1] All terminals are spring loaded on frame sizes S00 & S0. Only the coil terminals are spring loaded on frame sizes S2 & S3.
[2] Max UL FLA = 65A at 460V
[3] Use Code **B0** for 3RT201, S00
[4] Use Code **H0** for 3RT201, S00
[5] 3RT201 and 3RT202 only
[6] at upper limit = 1.1 x U_S

Selection and ordering data

*** AC/DC Coils with built in surge suppressor**
*** Coil Types (40Hz to 60Hz, DC):**
*** Conventional Coil**
*** Solid-state operated coil with wider range and 24 V DC PLC input**
*** Solid-state operated coil with Remaining Lifetime Indication (RLT)**
*** Box terminals ordered separately**

3RT1054-6A. . 6

3RT1065-6P. . 5

Frame Size	Amp Ratings AC3	AC1	Single-phase HP ratings 115V	230V	Three-phase HP ratings 200V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals on coil and aux. Order No.	Spring-type terminals on coil and aux. contacts Order No.	Weight approx. kg
3RT 3-pole Contactors													
S6	**115**	160	—	25	40	50	**100**	125	2	2	**3RT1054-6□●●6**	**3RT1054-2□●●6**	
	150	185	—	30	50	60	**125**	150	2	2	**3RT1055-6□●●6**	**3RT1055-2□●●6**	3.5
	185	215	—	30	60	75	**150**	200	2	2	**3RT1056-6□●●6**	**3RT1056-2□●●6**	
S10	**225**	275	—	—	60	75	**150**	200	2	2	**3RT1064-6□●●6**	**3RT1064-2□●●6**	
	265	330	—	—	75	100	**200**	250	2	2	**3RT1065-6□●●6**	**3RT1065-2□●●6**	6.7
	300	330	—	—	100	125	**250**	300	2	2	**3RT1066-6□●●6**	**3RT1066-2□●●6**	
S12	**400**	430	—	—	125	150	**300**	400	2	2	**3RT1075-6□●●6**	**3RT1075-2□●●6**	
	500	610	—	—	150	200	**400**	500	2	2	**3RT1076-6□●●6**	**3RT1076-2□●●6**	10.5
	UC Conventional Coil										**□ A N**	**□ A N**	
	Solid State Operated Coil =										**N**	**N**	
	Solid State Operated Coil with RLT =										**P●●5**	**—**	

NEMA Size	Amp Ratings	Single-phase HP ratings 115V	230V	Three-phase HP ratings 208V	230V	460V	575V	Auxiliary contacts NO	NC	Screw Terminals on coil and aux. Order No.	Spring-type terminals on coil and aux. contacts Order No.	Weight approx. kg
NEMA Labeled Contactors												
4	**135**	—	30	40	50	**100**	100	2	2	**3RT1056-6A●●6-0UA0**	**—**	3.5
5	**300**	—	—	100	125	**250**	300	2	2	**3RT1066-6A●●6-0UA0**	**—**	6.7
6	**400**	—	—	150	200	**400**	500	2	2	**3RT1076-6A●●6-0UA0**	**—**	10.5

All coil voltages are in the adjacent table.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/143-2/151.
For description, see page 2/106-2/107.
For int. circuit diagrams, see page 2/196-2/198.
For dimension drawings, see page 2/213-2/217.

Sizes S6 to S12 Coil Codes - UC operation (AC 50 to 60 Hz and DC)

UC Conventional Coil		Solid-State Coil		
Rated control supply voltage Us **Us min ... Us max[1]**	**3RT1. 5.-.A**	Rated control supply voltage Us **Us min ... Us max[1]**	**3RT1. 5.-.N**	**3RT1. 5.-.P**
	3RT1. 6.-.A		**3RT1. 6.-.N**	**3RT1. 6.-.P**
	3RT1. 7.-.A		**3RT1. 7.-.N**	**3RT1. 7.-.P**
Coil Codes	**●●**	**Coil Codes**	**●●**	**●●**
23 ... 26 V AC/DC	B3	21 ... 27.3 V AC/DC	B3	—
42 ... 48 V AC/DC	D3	96 ... 127 V AC/DC	F3	F3
110 ... 127 V AC/DC	F3	200 ... 277 V AC/DC	P3	P3
200 ... 220 V AC/DC	M3			
220 ... 240 V AC/DC	P3			
240 ... 277 V AC/DC	U3			
380 ... 420 V AC/DC	V3			
440 ... 480 V AC/DC	R3			
500 ... 550 V AC/DC	S3			
575 ... 600 V AC/DC	T3			

1) Operating range:
0.8 x Us min to 1.1 × Us max.

Contactor with integrated failsafe connection

Features

New Contactors from 100 to 400 HP for direct control by fail-safe controllers

- First contactor with fail-safe input
- Certified for use up to the highest safety level
- SIL CL 2 with one / SIL CL 3 with two contactors

Benefits

- Savings on standard outputs in the controller
- Space savings due to elimination of the coupling level
- Less wiring
- Simplified safety assessment

Overview

The size S6 to S12 range of tried and tested contactors from 100 to 400 HP @ 480V has been expanded to include versions suitable for direct control from fail-safe controllers, rendering the coupling level superfluous. The new contactors are also available with non-removable, lateral auxiliary switches, enabling fulfilment of Swiss Accident Insurance Institute (SUVA) requirements.

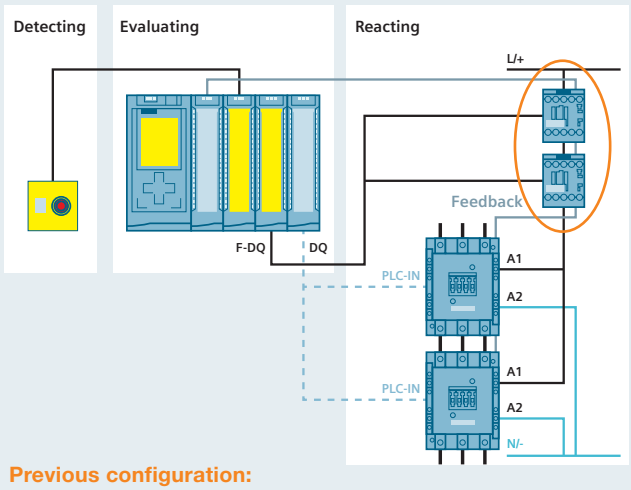
The new contactors constitute the logical extension and further development of the SIRIUS Modular System, serving to promote safe switching. They are the first contactors on the market to be equipped with an input for fail-safe signals. This makes it possible to attain SIL 2 and/or PLc with just one contactor and SIL 3 and/or PLe with two contactors in series according to IEC 62061 and ISO 13849-1.

The big advantage of this solution is that it saves on additional, possibly positively-driven coupling relays and makes evaluation of safety information considerably easier.

This reduction in coupling relays is also a huge plus point for non-safety applications. Whereas previously space, money and wiring expertise were required in order to operate contactors from 100 HP and higher using controllers, both functional and safety switching can now take place by direct activation.

Using the Safety Evaluation Tool you can quickly find the right contactor and safely configure your application.

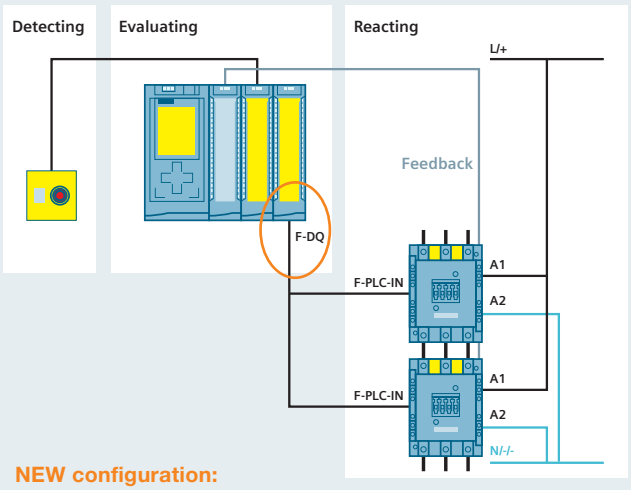
Save space and costs with a direct connection to the controller – no need for coupling relays!



Previous configuration:

3RT1 size S6 for high motor outputs with standard PLC-IN

- Normal switching duty via standard IO and PLC-IN
- Safety-related tripping initated by monitoring coupled links
- Feedback of the two S6 size 3RT1 contacts and the coupling relays via standard IO



NEW configuration:

3RT1 size S6 for high motor outputs with new contactor with fail-safe F-PLC-IN

- A1-A2 supplied via standard power supply (unit)
- Normal switching duty via F-DQ and F-PLC-IN
- Safety-related tripping via the same signal
- Feedback of the two S6 size 3RT1 via standard IO

AC/DC Operation

- Solid-state operating mechanism (with integrated varistor) with fail-safe control input for safety-related applications to SIL CL 3
- 24 V DC control signal input, e.g. for control via the fail-safe output module of a controller (F-PLC) or safety relay
- Attainable Safety Integrity Level (SIL):
  - With one contactor: SIL CL 2 acc. to IEC 62061 or PL c acc. to ISO 13849-1
  - With two contactors in series: SIL CL 3 acc. to IEC 62061 or PL e acc. to ISO 13849-1according to IEC 60947-4-1, test conditions for utilization category AC-1
- Version with removable lateral auxiliary switches or permanently mounted auxiliary switches and additional approval according to SUVA (on request)
- For screw fixing
- Auxiliary and control conductors: Screw or spring-type terminals
- Main conductors: Busbar connections; a connection kit with screws, spring washer and nut is enclosed.

For more information on safety systems, see Section 13.


3RT105.-6S.36


3RT106.-6S.36


3RT107.-6S.36


3RT105.-6S.36-3PA0


3RT107.-6S.36-3PA0

Selection and ordering data

Frame Size	Amp Ratings AC3	Amp Ratings AC1	Single-phase HP ratings 115V	Single-phase HP ratings 230V	Three-phase HP ratings 200V	Three-phase HP ratings 230V	Three-phase HP ratings **460V**	Three-phase HP ratings 575V	Auxiliary contacts NO	Auxiliary contacts NC	Rated control supply voltage U_S 50/60 Hz AC or DC	**Screw Terminals on coil and aux.** Order No.
Solid-state operating mechanism												
With two removable laterally mounted auxiliary switches												
S6	**115**	160	—	25	40	50	**100**	125	2	2	96 ... 127 200 ... 270	**3RT1054-6SF36** **3RT1054-6SP36**
	150	185	—	30	50	60	**125**	150	2	2	96 ... 127 200 ... 277	**3RT1055-6SF36** **3RT1055-6SP36**
	185	215	—	30	60	75	**150**	200	2	2	96 ... 127 200 ... 277	**3RT1056-6SF36** **3RT1056-6SP36**
S10	**225**	275	—	—	60	75	**150**	200	2	2	96 ... 127 200 ... 277	**3RT1064-6SF36** **3RT1064-6SP36**
	265	330	—	—	75	100	**200**	250	2	2	96 ... 127 200 ... 277	**3RT1065-6SF36** **3RT1065-6SP36**
	300	330	—	—	100	125	**250**	300	2	2	96 ... 127 200 ... 277	**3RT1066-6SF36** **3RT1066-6SP36**
S12	**400**	430	—	—	125	150	**300**	400	2	2	96 ... 127 200 ... 277	**3RT1075-6SF36** **3RT1075-6SP36**
	500	610	—	—	150	200	**400**	500	2	2	96 ... 127 200 ... 277	**3RT1076-6SF36** **3RT1076-6SP36**
With two permanently laterally mounted auxiliary switches												
S6	**115**	160	—	25	40	50	**100**	125	2	2	96 ... 127 200 ... 270	**3RT1054-6SF36-3PA0** **3RT1054-6SP36-3PA0**
	150	185	—	30	50	60	**125**	150	2	2	96 ... 127 200 ... 277	**3RT1055-6SF36-3PA0** **3RT1055-6SP36-3PA0**
	185	215	—	30	60	75	**150**	200	2	2	96 ... 127 200 ... 277	**3RT1056-6SF36-3PA0** **3RT1056-6SP36-3PA0**
S10	**225**	275	—	—	60	75	**150**	200	2	2	96 ... 127 200 ... 277	**3RT1064-6SF36-3PA0** **3RT1064-6SP36-3PA0**
	265	330	—	—	75	100	**200**	250	2	2	96 ... 127 200 ... 277	**3RT1065-6SF36-3PA0** **3RT1065-6SP36-3PA0**
	300	330	—	—	100	125	**250**	300	2	2	96 ... 127 200 ... 277	**3RT1066-6SF36-3PA0** **3RT1066-6SP36-3PA0**
S12	**400**	430	—	—	125	150	**300**	400	2	2	96 ... 127 200 ... 277	**3RT1075-6SF36-3PA0** **3RT1075-6SP36-3PA0**
	500	610	—	—	150	200	**400**	500	2	2	96 ... 127 200 ... 277	**3RT1076-6SF36-3PA0** **3RT1076-6SP36-3PA0**

Selection and ordering data

- **AC/DC operation** (40 Hz ... 60 Hz, DC)
- **Withdrawable coils**
- **Integrated coil circuit** (varistor)
- **Auxiliary and control conductors: screw connections**
- **Main conductor: bar connections**

3RT12 6 .

3RT12 7 .

Size	Horsepower ratings and utilization categories						Auxiliary contacts, lateral		Rated control supply voltage U_s	Order No.	Weight approx.
	AC-3 Maximum inductive current	Ratings of three-phase motors 200 V	230 V	**460 V**	575 V	AC-1 Maximum resistive current					
	Amps	HP	**HP**	**HP**	HP	Amps	NO	NC	AC/DC V		kg
Conventional operating mechanism											
S10	225	60	**75**	**150**	200	330	2	2	110 ... 127 220 ... 240	**3RT12 64-6AF36** **3RT12 64-6AP36**	6.4
	265	75	**100**	**200**	250	330	2	2	110 ... 127 220 ... 240	**3RT12 65-6AF36** **3RT12 65-6AP36**	
	300	100	**125**	**250**	300	330	2	2	110 ... 127 220 ... 240	**3RT12 66-6AF36** **3RT12 66-6AP36**	
S12	400	125	**150**	**300**	400	610	2	2	110 ... 127 220 ... 240	**3RT12 75-6AF36** **3RT12 75-6AP36**	9.6
	500	150	**200**	**400**	500	610	2	2	110 ... 127 220 ... 240	**3RT12 76-6AF36** **3RT12 76-6AP36**	
Solid-state operating mechanism · for DC 24 V PLC output											
S10	225	60	**75**	**150**	200	330	2	2	96 ... 127 200 ... 277	**3RT12 64-6NF36** **3RT12 64-6NP36**	6.4
	265	75	**100**	**200**	250	330	2	2	96 ... 127 200 ... 277	**3RT12 65-6NF36** **3RT12 65-6NP36**	
	300	100	**125**	**250**	300	330	2	2	96 ... 127 200 ... 277	**3RT12 66-6NF36** **3RT12 66-6NP36**	
S12	400	125	**150**	**300**	400	610	2	2	96 ... 127 200 ... 277	**3RT12 75-6NF36** **3RT12 75-6NP36**	9.6
	500	150	**200**	**400**	500	610	2	2	96 ... 127 200 ... 277	**3RT12 76-6NF36** **3RT12 76-6NP36**	

.

Universal Coil Selection for 3RT126 through 3RT127: Conventional Operation										
Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 .. 26 V	42 .. 48 V	110 .. 127 V	200 .. 220 V	220 .. 240 V	240 .. 277 V	380 .. 420 V	440 .. 480 V	500 .. 550 V	575 .. 600 V

Solid State Selection for 3RT126 through 3RT127: Solid-State			
Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 .. 27.3 V	96 .. 127 V	200 .. 277 V

For further vacuum contactors, 500Hp and 700Hp (3TF68/69), see page 2/55.
For auxiliaries and accessories, see page 2/70 .
For spare parts, see page 2/100-2/101.
For technical data, see page 2/154-2/159.
For int. circuit diagrams, see page 2/198
For dimension drawings, see page 2/218.

Standards

IEC 60947-1, EN 60947-1
IEC 60947-4-1, EN 60947-4-1
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

Design

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106, Part 100. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

Mountable auxiliary contacts

Size S00: 4 auxiliary contacts of which up to 3 can be NC.
Size S0 & S2: 4 additional auxiliary contacts up to 3 can be NC.
Sizes S2 and S3: Up to 4 auxiliary contacts (either laterally mounted or snappped onto the top).

Contactor assemblies with mechanical interlock

The 4-pole 3RT23 contactors with 4 NO contacts as the main contacts are suitable for making contactor assemblies with a mechanical interlock, e.g. for system transfers.

Size S00: Contactor assemblies can be made using two 3RT231. contactors in conjunction with the mechanical interlock and two connecting clips (Order No. 3RA2912-2H, pack comprising 10 interlocking elements and 20 clips for 10 contactor assemblies, see accessories on page 2/72).

Size S0: In order to make 4-pole contactor assemblies using two 3RT232. contactors, the fourth pole of the left-hand contactor must always be moved to the left-hand side. The contactor assembly can then be made easily with the aid of the 3RA2922-2H mechanical interlock and connecting clip set fitted between the two contactors.

Sizes S2 and S3: Contactor assemblies can be made using two 3RT23 3 or 3RT23 4. contactors in conjunction with the laterally mountable mechanical interlock and the mechanical connectors. The mechanical interlock for fitting onto the front cannot be used for size S2 and S3 contactors.

Application

- Switching resistive loads
- Isolating systems with unearthed or poorly earthed neutral conductors
- System transfers when alternative AC power supplies are used
- As contactors which only carry current and do not have to switch in case of inductive loads – e.g. variable-speed operating mechanisms
- Switching mixed loads in distribution systems (e.g. for supplying heaters, lamps, motors, PC power supply units) with p.f. > 0.8 according to IEC 60947-4-1, test conditions for utilization category AC-1

Selection and ordering data

Rating data			Auxiliary contacts			Rated control supply voltage U_s 50/60 Hz	AC Operation Screw Terminals [1] Order No.	Rated control supply voltage U_s	DC Operation Screw Terminals [1] Order No.
AC-1 Max resist. current I_e		UL ratings AC loads at 600 V,	Identification No.	Version					
40°C	60°C	60 Hz		NO	NC				
Amps		Amps				V AC		V DC	
For screwing and stapping onto 35 mm mounting rail									
3RT23 17-1AP60									
Size S00 – Auxiliary switches can be retrofitted									
18	16	**18**	—	—	—	24	**3RT23 16-1AB00**	24	**3RT23 16-1BB40**
						110/120	**3RT23 16-1AK60**	125	**3RT23 16-1BG40**
						220/240	**3RT23 16-1AP60**	220	**3RT23 16-1BM40**
22	20	**20**	—	—	—	24	**3RT23 17-1AB00**	24	**3RT23 17-1BB40**
						110/120	**3RT23 17-1AK60**	125	**3RT23 17-1BG40**
						220/240	**3RT23 17-1AP60**	220	**3RT23 17-1BM40**
3RT23 27-1AP60									
Size S0 – Terminal designations according to EN 50012 —1 NO + 1 NC, identification number 11E									
35 [2]	30 [2]	**30**	11E	1	1	24	**3RT23 25-1AC20**	24	**3RT23 25-1BB40**
						110/120	**3RT23 25-1AK60**	125	**3RT23 25-1BG40**
						220/240	**3RT23 25-1AP60**	220	**3RT23 25-1BM40**
40 [2]	35 [2]	**35**	11E	1	1	24	**3RT23 26-1AC20**	24	**3RT23 26-1BB40**
						110/120	**3RT23 26-1AK60**	125	**3RT23 26-1BG40**
						220/240	**3RT23 26-1AP60**	220	**3RT23 26-1BM40**
50 [2]	42 [2]	**38**	11E	1	1	24	**3RT23 27-1AC20**	24	**3RT23 27-1BB40**
						110/120	**3RT23 27-1AK60**	125	**3RT23 27-1BG40**
						220/240	**3RT23 27-1AP60**	220	**3RT23 27-1BM40**
3RT23 36-1AP60									
Size S2								V UC	
60	55	**60**	11E	1	1	24	**3RT23 36-1AC20**	20-33	**3RT23 36-1NB30**
						110/120	**3RT23 36-1AK60**	83-155	**3RT23 36-1NF30**
						220/240	**3RT23 36-1AP60**	175-280	**3RT23 36-1NP30**
110	95	**105**	11E	1	1	24	**3RT23 37-1AC20**	20-33	**3RT23 37-1NB30**
						110/120	**3RT23 37-1AK60**	83-155	**3RT23 37-1NF30**
						220/240	**3RT23 37-1AP60**	175-280	**3RT23 37-1NP30**
Size S3								V UC	
140	130	**120**	—	—	—	24	**3RT23 46-1AC20**	20-33	**3RT23 46-1NB30**
						110/120	**3RT23 46-1AK60**	83-155	**3RT23 46-1NF30**
						220/240	**3RT23 46-1AP60**	175-280	**3RT23 46-1NP30**

1) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT23 16-2AK60"

2) Minimum conductor cross-section 8 AWG.

For further voltages, see page 2/51.
For coil voltage tolerance, p. 2/51
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/168-2/169.
For in. circuit diagrams, see page 2/193-2/198.
For dimension drawings, see page 2/219.

Application

AC and DC operation (size S3)
UC operation (AC/DC) (sizes S6 to S12)

IEC 60 947, EN 60 947 (VDE 0660)

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

3RT14/3RT24 contactors are used for switching resistive loads.

(AC-1) or as contactors, for example in variable-speed drives which normally only have to carry the current.

The accessories for the SIRIUS 3RT10/3RT20 contactors can also be used here.

Selection and ordering data

3RT24 46-1A..0

Ratings AC-1 utilization category, IEC Ratings: Maximum current Amps	Rated power of three phase loads cos Ø = 0.95 (@ 60°C) 230V kW	400V kW	500V kW	690V kW	UL Ratings: Max Current Amps	230/240V Hp	460/480V Hp	575/600V Hp	Rated control supply voltage U_s	Order No.	Weight approx. kg
With screw connections · for screwing and snapping onto 35 mm and 75 mm standard mounting rails											
Size S3 · (without auxiliary contacts)											
• **AC operation**											
140	50	86	107	148	140	15	30	40	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	**3RT24 46-1AC2 0** **3RT24 46-1AK6 0** **3RT24 46-1AP6 0**	1.8
• **DC operation · DC solenoid system**											
140	50	86	107	148	131	15	30	40	DC 24 V DC 48 V	**3RT24 46-1BB4 0** **3RT24 46-1BW40**	2.7

- **AC/DC operation** (40 Hz ... 60 Hz, DC)
- **Withdrawable coils**
- **Integrated coil circuit** (varistor)
- **Auxiliary and control conductors: screw connections**
- **Main conductor: bar connections**

3RT14 6.

Size	Ratings AC-1 utilization category, IEC Ratings: AC-1 Maximum resistive current Amps	Rated power of three phase loads cos Ø = 0.95 (@ 60°C) 230V kW	400V kW	500V kW	690V kW	UL Rating: Max Current Amps	Auxiliary contacts, lateral NO	NC	AC/DC V	Rated control supply voltage U_s	Order No.	Weight approx. kg
Conventional operating mechanism												
S6	**275**	95	165	205	285	210	2	2	110 ... 127 220 ... 240		**3RT14 56-6AF36** **3RT14 56-6AP36**	3.1
S10	**400**	145	250	315	430	360	2	2	110 ... 127 220 ... 240		**3RT14 66-6AF36** **3RT14 66-6AP36**	5.7
S12	**690**	245	430	535	740	580	2	2	110 ... 127 220 ... 240		**3RT14 76-6AF36** **3RT14 76-6AP36**	9.1
Solid-state operating mechanism · for DC 24 V PLC output												
S6	**275**	95	165	205	285	210	2	2	96 ... 127 200 ... 277		**3RT14 56-6NF36** **3RT14 56-6NP36**	3.1
S10	**400**	145	250	315	430	360	2	2	96 ... 127 200 ... 277		**3RT14 66-6NF36** **3RT14 66-6NP36**	5.7
S12	**690**	245	430	535	740	580	2	2	96 ... 127 200 ... 277		**3RT14 76-6NF36** **3RT14 76-6NP36**	9.1
Solid-state operating mechanism · for DC 24 V PLC with remaining lifetime indication												
S6	**275**	95	165	205	285	210	1	1	96 ... 127 200 ... 277		**3RT14 56-6PF35** **3RT14 56-6PP35**	3.1
S10	**400**	145	250	315	430	360	1	1	200 ... 277		**3RT14 66-6PP35**	5.7
S12	**690**	245	430	535	740	580	1	1	200 ... 277		**3RT14 76-6PP35**	9.1

3RT14 7.

Universal Coil Selection for 3RT145 through 3RT147: Conventional Operation										
Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 .. 26 V	42 .. 48 V	110 .. 127 V	200 .. 220 V	220 .. 240 V	240 .. 277 V	380 .. 420 V	440 .. 480 V	500 .. 550 V	575 .. 600 V

Universal Coil Selection for 3RT145 through 3RT147: Solid-State			
Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 .. 27.3 V	96 .. 127 V	200 .. 277 V

Note: B3 code not available for Remaining Lifetime Contactors.

For further coil voltages, see page 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/160-2/167.
For int. circuit diagrams, see page 2/198.
For dimension drawings, see page 2/213, 2/215-2/216.

AC and DC operation

IEC 60 947-4-1/EN 60 947-4-1
(VDE 0660, Part 102)

Design

The contactors are suitable for use in any climate. They are safe to touch according to EN 50274. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

Mountable auxiliary contacts

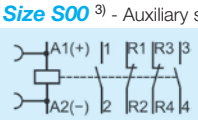
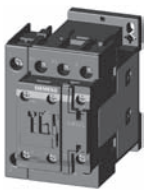
Size S00 and S0:
4 auxiliary contacts, of which up to 4 can be NC contacts.

Size S2
Up to 4 auxiliary contacts (either laterally mounted or snapped onto the top; auxiliary switch blocks to EN 50 012 and EN 50 005)

Application

- Changing the polarity of hoisting gear motors
- Switching two separate loads from the same source

Selection and ordering data

Rating data: AC-2/AC-3 T_u: up to 60°C, Max Current I_e at 400 V	Max motor HP at **460 V**, 60 Hz		AC-1 Max resistive current 40°C	AC-1 Max resistive current 60°C	Auxiliary contacts Version NO	Auxiliary contacts Version NC	Rated control supply voltage U_S	**AC Operation** [2] **Screw terminals** Order No.	Rated control supply voltage U_S	**DC Operation** [2] **Screw terminals** Order No.
Amps	**NO**	**NC**	Amps				V AC, 50/60 Hz		V DC	
For screwing and snapping onto 35 mm standard mounting rail										
3RT25 16-1AB00										
Size S00 [3] - Auxiliary switches can be retrofitted										
										
9	**5**		18	16	—	—	24	**3RT25 16-1AB00**	24	**3RT25 16-1BB40**
							110/120	**3RT25 16-1AK60**	125	**3RT25 16-1BG40**
							220/240	**3RT25 16-1AP60**	220	**3RT25 16-1BM40**
12	**7.5** [4]		22	20	—	—	24	**3RT25 17-1AB00**	24	**3RT25 17-1BB40**
							110/120	**3RT25 17-1AK60**	125	**3RT25 17-1BG40**
							220/240	**3RT25 17-1AP60**	220	**3RT25 17-1BM40**
3RT25 26-1AC20										
16	**10** [4]		22	20	—	—	24	**3RT25 18-1AB00**	24	**3RT25 18-1BB40**
							110/120	**3RT25 18-1AK60**	125	**3RT25 18-1BG40**
							220/240	**3RT25 18-1AP60**	220	**3RT25 18-1BM40**
Size S0 - Terminal designations according to EN 50012, 1 NO + 1 NC, identification number 11E										
										
25	**15**	**15**	40	35	1	1	24	**3RT25 26-1AC20**	24	**3RT25 26-1BB40**
							110/120	**3RT25 26-1AK60**	125	**3RT25 26-1BG40**
							220/240	**3RT25 26-1AP60**	220	**3RT25 26-1BM40**
3RT25 35-1AC20										
Size S2										
										
									V UC	
35	**30**	**20**	60	55	1	1	24	**3RT25 35-1AC20**	20-33	**3RT25 35-1NB30**
							110/120	**3RT25 35-1AK60**	83-155	**3RT25 35-1NF30**
							220/240	**3RT25 35-1AP60**	175-280	**3RT25 35-1NP30**
41	**30**	**25**	70	60	1	1	24	**3RT25 36-1AC20**	20-33	**3RT25 36-1NB30**
							110/120	**3RT25 36-1AK60**	83-155	**3RT25 36-1NF30**
							220/240	**3RT25 36-1AP60**	175-280	**3RT25 36-1NP30**

For further voltages, see page 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For spare parts, see page 2/96-2/101.
For technical data, see page 2/170-2/171.
For int. circuit diagrams, see page 2/193-2/198.
For dimension drawings, see page 2/219.

1) For changing polarity; not suitable for reversing.

2) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT25 16-2AK60"

3) Size S00:
Coil voltage tolerance
at 50 Hz: 0.8 ... 1.1 x U_S
at 60 Hz: 0.85 ... 1.1 x U_S

4) The NC contact can switch up to 5 HP.

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactor relays are finger-safe according to EN 50274. The size S00 contactor relays have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactor relays (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 x U_S and are fitted as standard with suppressor diodes to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactor relays without series resistor

Control and auxiliary circuits

These contactor relays have an extended operating range from 0.7 to 1.25 x U_S; the solenoid coils are fitted with a suppressor diode. An additional series resistor is not required.

Note:
An additional auxiliary switch block cannot be mounted.

Side-by-side mounting

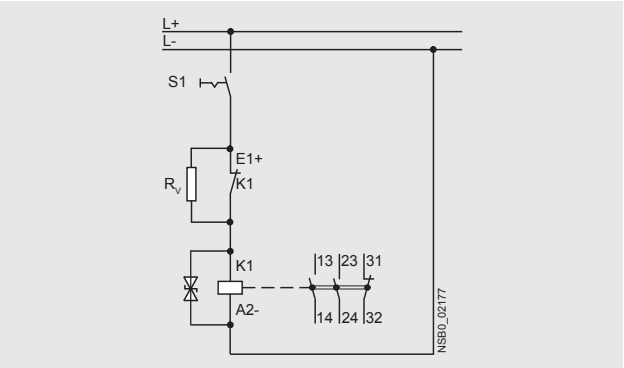
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

Contactor relays with series resistor

Control and auxiliary circuits

The DC solenoid systems of the contactor relays are modified (to hold-in coil) by means of a series resistor.

The size S00 contactor relays are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated.



A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

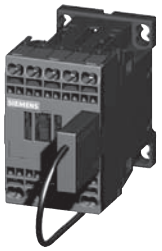
Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C.

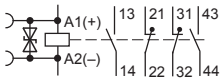
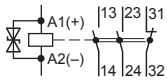
Selection and ordering data

DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with suppressor diode

3RH21 22-2K.40



3RH21 22-2K.40-0LA0

Rated operational current I_e/AC-15/AC-14 T_U: 70 °C at				Contacts		Rated control supply voltage U_s	Spring-type terminals		Weight approx.
230 V	400 V	500 V	690 V	Version			Order No.		
A	A	A	A	NO	NC	V DC			kg
3RH21 contactor relays									
Size S00									
Without series resistor									
Terminal designations according to EN 50011									
2 NO + 2 NC, identification number **22E**									
									
10	3	2	1	2	2[1]	24	**3RH21 22-2KB40**		0.300
						110	**3RH21 22-2KF40**		0.300
With series resistor									
Terminal designations according to EN 50005									
2 NO + 1 NC, identification number **21E**									
									
10	3	2	1	2	1[2]	24	**3RH21 22-2KB40-0LA0**		0.300
						110	**3RH21 22-2KF40-0LA0**		0.300

[1] It is not possible to mount an auxiliary switch block.

[2] 4-pole auxiliary switch block according to EN 50005 can be mounted.

More information

Contactors	Type		3RH21 ..
Upright mounting position			
• Contactors with series resistor			Special version (on request)
• Contactors without series resistor			Special version (on request)
Ambient temperature			
• During operation		°C	-40 ... +70
• During storage		°C	-55 ... +80
Solenoid coil operating range	DC		0.7 ... 1.25 x U_s
Power consumption of the solenoid coils			For cold coil and 1.0 x U_s
• Contactors with series resistor	- Closing	W	13
	- Closed	W	4
• Contactors without series resistor	- Closing	W	2.8
	- Closed	W	2.8

All specifications and technical specifications not mentioned here are identical to those of the standard contactor relays.

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1,
for requirements according to IEC 60077-1 and IEC 60077-2.

The contactors are finger-safe according to EN 50274. The contactors have spring-type connections as well as screw connections. The size S00 and S0 contactors have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 or 1.3 x U_S and are fitted as standard with suppressor diodes. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactors without series resistor

Control and auxiliary circuits

These contactors have an extended operating range from 0.7 to 1.25 x U_S; on size S00 the coils are fitted with suppressor diodes, on size S0 with varistors. An additional series resistor is not required.

Note:
An additional auxiliary switch block cannot be mounted.

Side-by-side mounting

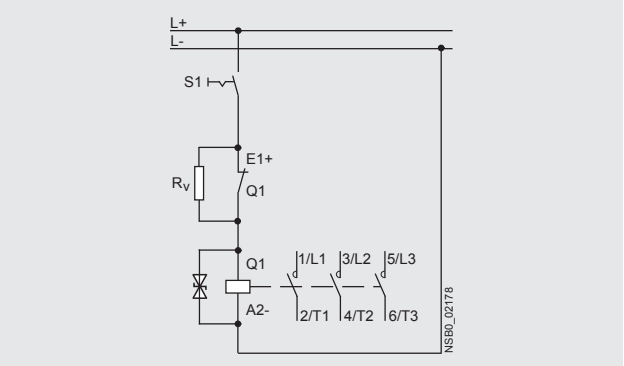
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

3RT20 1. contactors with series resistor

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.25 x U_S and are fitted as standard with suppressor diodes to provide protection against overvoltage.

The DC solenoid systems of the contactors are modified (to holding excitation) by means of a series resistor.



The size S00 contactors are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated. A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

A circuit diagram showing the terminals is labeled on each contactor. One NC of the auxiliary contacts is required for the series resistor function. The selection and ordering data shows the number of additional, unassigned auxiliary contacts. With size S00 it is possible to extend the number of auxiliary contacts.

Side-by-side mounting

At ambient temperatures up to 70 °C, the size S00 contactors and contactor relays are allowed to be mounted side by side.

3RT20 2. contactors with solid-state operating mechanism, extended operating range

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.3 x U_S and are fitted as standard with varistors to provide protection against overvoltage.

The contactors are energized via upstream control electronics which ensure the coil operating range of 0.7 to 1.3 x U_S at an ambient temperature of 70 °C. They are supplied as complete units with integrated coil electronics. A varistor is integrated for damping opening surges in the coil.

The mounting possibilities for auxiliary switches correspond to those of the standard contactors for switching motors in the matching size (see page 2/60).

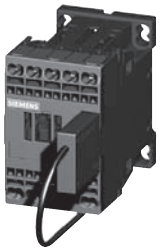
Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C for these contactor versions in size S0.

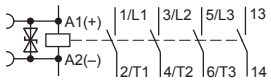
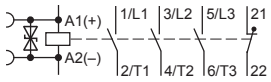
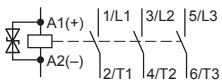
Selection and ordering data

DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with suppressor diode (S00)

3RT20 1.-2K.4.



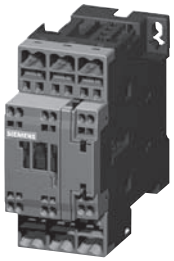
3RT20 1.-2K.42-0LA0

Rated data AC-3					Auxiliary contacts			Rated control supply voltage U_s	Spring-type terminals		Weight approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version					
									Order No.		
400 V	200 V	230 V	**460 V**	575 V		NO	NC				
A	HP	HP	**HP**	HP				V DC			kg
3RT20 contactors for switching motors											
Size S00											
Without series resistor[4]											
Terminal designations according to EN 50012 or EN 50005											
• 1 NO, identification number **10E**											
											
• 1 NC, identification number **01**											
											
12	--	3	**7.5**	10	**10E**[1]	1	--	24	**3RT20 17-2KB41**		0.300
								125	**3RT20 17-2KG41**		0.300
12	--	3	**7.5**	10	**01**[1]	--	1	24	**3RT20 17-2KB42**		0.300
								125	**3RT20 17-2KG42**		0.300
With series resistor											
											
12	--	3	**7.5**	10	**--**[2]	--	1[3]	24	**3RT20 17-2KB42-0LA0**		0.300
								125	**3RT20 17-2KG42-0LA0**		0.300
16	--	5	**10**	10	**--**[2]	--	1[3]	24	**3RT20 18-2KB42-0LA0**		0.300
								125	**3RT20 18-2KG42-0LA0**		0.300

For accessories and spare parts, see page 2/68-2/71.

1) It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.
2) One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.
3) NC contact cannot be used because it is required for switching the series resistor.
4) Versions available with screw terminals.

DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with varistor (S0)



3RT20 2.-2K.40

3RT20 2.-2X.40-0LA2

Rated data AC-3					Auxiliary contacts			Rated control supply voltage U_s	**Spring-type terminals**	Weight approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version			Order No.	
400 V	200 V	230 V	**460 V**	575 V		NO	NC			
A	HP	HP	**HP**	HP				V DC		kg
3RT20 contactors for switching motors										
Size S0										
Terminal designations according to EN 50012 1 NO + 1 NC, identification number **11E**										
Without series resistor[1]										
16	--	5	**10**	15	**11E**	1	1	24 125	**3RT20 25-2KB40** **3RT20 25-2KG40**	0.600 0.600
25	--	7.5	**15**	20	**11E**	1	1	24 125	**3RT20 26-2KB40** **3RT20 26-2KG40**	0.600 0.600
32	--	10	**20**	25	**11E**	1	1	24 125	**3RT20 27-2KB40** **3RT20 27-2KG40**	0.600 0.600
With solid-state operating mechanism										
16	--	5	**10**	15	**11E**	1	1	24 125	**3RT20 25-2XB40-0LA2** **3RT20 25-2XG40-0LA2**	0.580 0.580
25	--	7.5	**15**	20	**11E**	1	1	24 125	**3RT20 26-2XB40-0LA2** **3RT20 26-2XG40-0LA2**	0.580 0.580
32	--	10	**20**	25	**11E**	1	1	24 125	**3RT20 27-2XB40-0LA2** **3RT20 27-2XG40-0LA2**	0.580 0.580
38	--	10	**25**	25	**11E**	1	1	24 125	**3RT20 28-2XB40-0LA2** **3RT20 28-2XG40-0LA2**	0.580 0.580

For accessories and spare parts, see page 2/68-2/71.

[1] It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

More information

Contactors	Type			3RT20 17	3RT20 2.	3RT20 2.-2XB40-0LA2	3RT20 2.-2XF40-0LA2
Ambient temperature							
• During operation			°C	-40 ... +70			
• During storage			°C	-55 ... +80			
Solenoid coil operating range	DC			0.7 ... 1.25 x U_s		0.7 ... 1.3 x U_s	
Power consumption of the solenoid coils				For cold coil and 1.0 x U_s			
• Contactors with series resistor		- Closing	W	13	--	--	--
		- Closed	W	4	--	--	--
• Contactors without series resistor		- Closing	W	2.8	4.5	--	--
		- Closed	W	2.8	4.5	--	--
• Contactors with solid-state operating mechanism		- Closing	W	--	--	6.7	13.2
		- Closed	W	--	--	0.8	1.56

All specs and technical specs not mentioned here are identical to those of the standard contactors for switching motors.

AC operation

IEC 60947-5, DIN EN 60947-5-1, (VDE 0660 Part 200)

The contactors are suitable for use in any climate and are finger safe per DIN EN 50274.

The 3RT26 capacitor contactors are application specific variants of the size S00 to S2 SIRIUS Innovations contactors. The capacitors are precharged by means of the mounted leading NO contacts and resistors; only then do the main contacts close. This prevents disturbances in the power system and welding of the contactors.

Only discharged capacitors are permitted to be switched on with capacitor contactors. Recommendation: use discharge chokes for parallel connection with the capacitors.

The capacitor contactors of size S00 contain either 1NO or 1NC in the basic unit and another unassigned NC contact in the auxiliary switch block fitted to the basic unit.

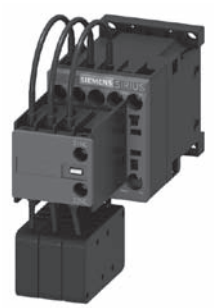
The auxiliary switch block which is snapped onto the capacitor contactor of sizes S0 contains the three leading NO contacts and one standard NO contact, which is unassigned.

The capacitor contactors of size S2 can be fitted additionally with a 2-pole auxiliary switch on the right side (2 NO, 2 NC or 1 NO + 1 NC), type 3RH19 21-1EA.. for lateral mounting.

For the capacitor making and breaking capacity of the basic 3RT20 contactor variant, see the technical data.

Selection and ordering data
AC operation

AC-6b utilization category For switching three-phase capacitors at an ambient temperature of 60 °C 2)					Current	Auxiliary contacts, unassigned	Rated control supply voltage U_s 1) 3)	Screw connection Order No.	Weight approx.
UL capacitor rating at operational voltage									
	200/208	230/240	460/480	575/600					
Phase	kvar	kvar	kvar	kvar			AC		kg
For screwing and snapping onto 35 mm standard mounting rail									
3RT26 17-1AK63									
• Size S00									
1Ø	3.6	4	8.3	10	18	1NO / 1NC	24 V, 50/60 Hz	**3RT26 17-1AB03**	0.24
3Ø	6.2	6.9	14	17			120 V, 60 Hz	**3RT26 17-1AK63**	
							240 V, 60 Hz	**3RT26 17-1AP63**	
• Size S0									
1Ø	4.8	5.3	11	13	24	1NO / 2NC	24 V, 50/60 Hz	**3RT26 25-1AC25**	0.49
3Ø	8.3	9.1	18	23			120 V, 60 Hz	**3RT26 25-1AK65**	
							240 V, 60 Hz	**3RT26 25-1AP65**	
1Ø	5.8	6.4	13	16	29	1NO / 2NC	24 V, 50/60 Hz	**3RT26 26-1AC25**	0.49
3Ø	10	11	22	28			120 V, 60 Hz	**3RT26 26-1AK65**	
							240 V, 60 Hz	**3RT26 26-1AP65**	
3RT2637-1NF35									
1Ø	6.6	7.3	15	18	33	1NO / 2NC	24 V, 50/60 Hz	**3RT26 27-1AC25**	0.49
3Ø	11	13	25	31			120 V, 60 Hz	**3RT26 27-1AK65**	
							240 V, 60 Hz	**3RT26 27-1AP65**	
1Ø	8.6	9.5	20	24	43	1NO / 2NC	24 V, 50/60 Hz	**3RT26 28-1AC25**	0.59
3Ø	15	16	33	41			120 V, 60 Hz	**3RT26 28-1AK65**	
							240 V, 60 Hz	**3RT26 28-1AP65**	
• Size S2									
1Ø	14	16	33	40	72A	2 NC	23-33 VUC	**3RT26 36-1NB35**	1.11
3Ø	25	27	55	69			83-155 VUC	**3RT26 36-1NF35**	
							175-280 VUC	**3RT26 36-1NP35**	
1Ø	20	22	45	54	98A	2 NC	20-33 VUC	**3RT26 37-1NB35**	1.11
3Ø	34	38	75	94			83-155 VUC	**3RT26 37-1NF35**	
							175-280 VUC	**3RT26 37-1NP35**	



1) Coil voltage tolerance: 0.85 ... 1.1 x U_s.
2) A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C

For further voltages, see page 2/51.
For auxiliaries and accessories, see page 2/68-2/85.
For technical data, see page 2/172.
For wiring diagram, see page 2/200.
For dimension drawings, see page 2/220.

DC Coil Selection for 3RT261 only

●Coil Code	B4	W4	E4	F4	G4	M4
DC	24 V	48 V	60 V	110 V	125 V	220 V

UC Coil Selection for 3RT262

●Coil Code	NB3	NF3	NP3
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT263

●Coil Code	B3	F3	P3
	20-33V	83-155V	175-280V

3) at upper limit = 1.1 x U_S

AC and DC operation

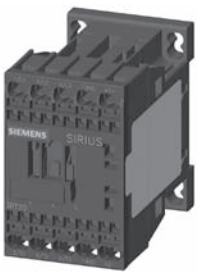
IEC 60947, EN 60947.
The 3RT20 coupling contactors for switching motors are tailored to the special requirements of working with electronic controls.

The 3RT20 1 coupling contactors cannot be expanded with auxiliary switch blocks.
Coupling contactors have a low power consumption and an extended solenoid coil operating range.

Depending on the version, the solenoid coils are supplied either without overvoltage damping or with a diode, suppressor diode or varistor connected as standard.

Selection and ordering data
DC operation

3RT2015-1HB41



3RT2015-2HB41

Surge suppressor	Ratings Utilization category		Auxiliary contacts			Screw connection	Spring-type connection	Weight approx.
	AC-3		Ident. no.	Design		Order No.	Order No.	(screw/ spring)
	Maximum inductive current	Maximum[1] horsepower ratings at 460 V						
	Amps	**HP**		NO	NC			kg
For screwing and snapping onto 35 mm standard mounting rail								
• Size S00 Terminal designations according to EN 50 012								
Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.7 to 1.25** × U_s Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)								
Diode, varistor or RC element can be mounted	7	**3**	**10E 01**	1 –	– 1	**3RT20 15-1HB41** **3RT20 15-1HB42**	**3RT20 15-2HB41** **3RT20 15-2HB42**	0.28/0.30
Diode integrated	7	**3**	**10E 01**	1 –	– 1	**3RT20 15-1J B41** **3RT20 15-1J B42**	**3RT20 15-2J B41** **3RT20 15-2J B42**	0.28/0.30
Suppressor diode integrated	7	**3**	**10E 01**	1 –	– 1	**3RT20 15-1KB41** **3RT20 15-1KB42**	**3RT20 15-2KB41** **3RT20 15-2KB42**	0.28/0.30
Diode, varistor or RC element can be mounted	9	**5**	**10E 01**	1 –	– 1	**3RT20 16-1HB41** **3RT20 16-1HB42**	**3RT20 16-2HB41** **3RT20 16-2HB42**	0.28/0.30
Diode integrated	9	**5**	**10E 01**	1 –	– 1	**3RT20 16-1J B41** **3RT20 16-1J B42**	**3RT20 16-2J B41** **3RT20 16-2J B42**	0.28/0.30
Suppressor diode integrated	9	**5**	**10E 01**	1 –	– 1	**3RT20 16-1KB41** **3RT20 16-1KB42**	**3RT20 16-2KB41** **3RT20 16-2KB42**	0.28/0.30
Diode, varistor or RC element can be mounted	12	**7.5**	**10E 01**	1 –	– 1	**3RT20 17-1HB41** **3RT20 17-1HB42**	**3RT20 17-2HB41** **3RT20 17-2HB42**	0.28/0.30
Diode integrated	12	**7.5**	**10E 01**	1 –	– 1	**3RT20 17-1J B41** **3RT20 17-1J B42**	**3RT20 17-2J B41** **3RT20 17-2J B42**	0.28/0.30
Suppressor diode integrated	12	**7.5**	**10E 01**	1 –	– 1	**3RT20 17-1KB41** **3RT20 17-1KB42**	**3RT20 17-2KB41** **3RT20 17-2KB42**	0.28/0.30

For technical data, see page 2/173.
For int. circuit diagrams, see page 2/192-2/197.
For dimension drawings, see page 2/211.

1) Complete HP ratings on page 2/126

Selection and ordering data
DC operation

3RT2015-1VB41

3RT2015-2VB41

3RT2024-1KB40

Surge suppressor	Ratings Utilization category AC-3 Maximum inductive current	Maximum horsepower ratings at 460 V	Auxiliary contacts Ident. no.	Design NO	Design NC	Screw connection Order No.	Spring-type connection Order No.	Weight approx. (screw/spring)
	Amps	**HP**						kg
For screwing and snapping onto 35 mm standard mounting rail								
• Size S00								
Terminal designations according to EN 50 012								
Rated control supply voltage U_s =DC 24 V, coil voltage tolerance **0.85 to 1.85** × U_s								
Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)								
Diode, varistor or RC element can be mounted	7	**3**	**10E**	1	–	**3RT20 15-1MB41-0KT0**	**3RT20 15-2MB41-0KT0**	0.28/0.30
			01	–	1	**3RT20 15-1MB42-0KT0**	**3RT20 15-2MB42-0KT0**	
Diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1VB41**	**3RT20 15-2VB41**	0.28/0.30
			01	–	1	**3RT20 15-1VB42**	**3RT20 15-2VB42**	
Suppressor diode integrated	7	**3**	**10E**	1	–	**3RT20 15-1SB41**	**3RT20 15-2SB41**	0.28/0.30
			01	–	1	**3RT20 15-1SB42**	**3RT20 15-2SB42**	
Diode, varistor or RC element can be mounted	9	**5**	**10E**	1	–	**3RT20 16-1MB41-0KT0**	**3RT20 16-2MB41-0KT0**	0.28/0.30
			01	–	1	**3RT20 16-1MB42-0KT0**	**3RT20 16-2MB42-0KT0**	
Diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1VB41**	**3RT20 16-2VB41**	0.28/0.30
			01	–	1	**3RT20 16-1VB42**	**3RT20 16-2VB42**	
Suppressor diode integrated	9	**5**	**10E**	1	–	**3RT20 16-1SB41**	**3RT20 16-2SB41**	0.28/0.30
			01	–	1	**3RT20 16-1SB42**	**3RT20 16-2SB42**	
Diode, varistor or RC element can be mounted	12	**7.5**	**10E**	1	–	**3RT20 17-1MB41-0KT0**	**3RT20 17-2MB41-0KT0**	0.28/0.30
			01	–	1	**3RT20 17-1MB42-0KT0**	**3RT20 17-2MB42-0KT0**	
Diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1VB41**	**3RT20 17-2VB41**	0.28/0.30
			01	–	1	**3RT20 17-1VB42**	**3RT20 17-2VB42**	
Suppressor diode integrated	12	**7.5**	**10E**	1	–	**3RT20 17-1SB41**	**3RT20 17-2SB41**	0.28/0.30
			01	–	1	**3RT20 17-1SB42**	**3RT20 17-2SB42**	
• Size S0								
Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.7 to 1.25** × U_s								
Power consumption of the coils **4.5 W** at 24 V no auxiliary switch blocks can be mounted.								
Varistor integrated	12	**7.5**	**11E**	1	1	**3RT20 24-1KB40**	**3RT20 24-2KB40**	0.58/0.60
	16	**10**	**11E**	1	1	**3RT20 25-1KB40**	**3RT20 25-2KB40**	0.58/0.60
	25	**15**	**11E**	1	1	**3RT20 26-1KB40**	**3RT20 26-2KB40**	0.58/0.60
	32	**20**	**11E**	1	1	**3RT20 27-1KB40**	**3RT20 27-2KB40**	0.58/0.60

For technical data, see page 2/173.
For int. circuit diagrams, see page 2/192-2/197.
For dimension drawings, see page 2/211.

Applications

"Safety" Contactors
Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4-1 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact.

In some industries, such as automotive, requirements have been established that a safety rated contactor must also have permanently mounted auxiliary contact blocks. See page 2/25 for Contactors with permanently mounted auxiliary contacts.

Siemens Contactors for "Safety" applications:
All Siemens standard 3RT, 3TF6, 40HN & 40PH Contactors are provided with positively driven (mirror) contacts which meet or exceed the criteria for "Safety Contactors" according to IEC 60947-4 Annex F which describes the requirements for mirror contact performance. When applying Safety Contactors in safety circuits, the NC auxiliary contacts must be wired in series or parallel and must be used as monitoring contacts with feedback to the safety evaluation device (i.e. safety relay or failsafe logic controller).

"Safety" Control Relays
Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously.

In some industries, such as automotive, requirements have been established that a safety rated control relays must also have permanently mounted auxiliary contact blocks. See page 2/20 for Control Relays with permanently mounted auxiliary contacts.

Siemens Control Relays for "Safety" applications:
All SIRIUS 3RH control relays (with at least 1 NC contact) meet or exceed the criteria for "Safety Control Relays" according to IEC 60947-5-1 Annex L. This is true for the basic 3RH relay with or without an additional auxiliary contact block.

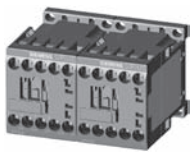

3RT20 2. -1A .00


3RT10 7. -6A ..6


3RH29 21. -1F


3RH29 21. -1DA 11


3RH21


3RH24


3RH2911-2HA..

Frame size	Contactors	Auxiliary contact block
S00	3RT201	3RH2911
	3RT231	
	3RT251	
	3RT261	3RH1911
S0	3RT202	3RH2921
	3RT232	
	3RT252	
	3RT262	3RH2921
S2	3RT203	3RH2921
	3RT233	
	3RT253	
	3RT263	
S3	3RT204	3RH2921
	3RT234	
	3RT244	
	3RT264	
S6	3RT105	3RH1921
	3RT145	
S10	3RT106	3RH1921
	3RT126	
	3RT146	
S12	3RT107	3RH1921
	3RT127	
	3RT147	
	3TF6	3TY7561-1UA00

Frame size	Control Relays	Auxiliary contact block
S00	3RH21	3RH2911
	3RH24	
	3TH20	3TX44

For contactors, see pages 2/8-2/11.
For auxiliaries contact blocks, see pages 2/68-2/70.
For control relays, see pages 2/52-2/54.
For auxiliaries contact blocks, see page 2/68-2/70..

Application

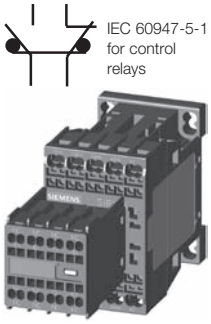
"Safety" Contactors

Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact. In some industries, such as Automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.

3RT202* -1AK64-3MA0

"Safety" Control Relays

Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously. In some industries, such as automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RH22**-2BB40

Application

Frame Size	Max. current AC3	Max. current AC1	Single-phase HP ratings 115V	Single-phase HP ratings 220/240V	Three-phase HP ratings 200V	Three-phase HP ratings 230V	Three-phase HP ratings 460V	Three-phase HP ratings 575V	Auxiliary contacts Ident. No.	NO	NC	Screw Terminals Order No.	Spring-Type Terminals [1] Order No.
	A	A	HP	HP	HP	HP	HP	HP					
Contactors with permanently mounted auxiliary contact blocks													
S00	6	18	¼	¾	1 ½	2	3	5	22E	2	2	**3RT2015-1●●●4-3MA0**	**3RT2015-2●●●4-3MA0**
	9	22	⅓	1	2	3	5	7 ½	22E	2	2	**3RT2016-1●●●4-3MA0**	**3RT2016-2●●●4-3MA0**
	12	22	½	2	3	3	7 ½	10	22E	2	2	**3RT2017-1●●●4-3MA0**	**3RT2017-2●●●4-3MA0**
	16	22	1	2	3	5	10	10	22E	2	2	**3RT2018-1●●●4-3MA0**	**3RT2018-2●●●4-3MA0**
S0	9	40	1	1	2	3	5	7 ½	22E	2	2	**3RT2023-1●●●4-3MA0**	**3RT2023-2●●●4-3MA0**
	12	40	1	2	3	3	7 ½	10	22E	2	2	**3RT2024-1●●●4-3MA0**	**3RT2024-2●●●4-3MA0**
	17	40	1	3	5	5	10	15	22E	2	2	**3RT2025-1●●●4-3MA0**	**3RT2025-2●●●4-3MA0**
	25	40	2	3	7 ½	7 ½	15	20	22E	2	2	**3RT2026-1●●●4-3MA0**	**3RT2026-2●●●4-3MA0**
	32	50	2	5	10	10	20	25	22E	2	2	**3RT2027-1●●●4-3MA0**	**3RT2027-2●●●4-3MA0**
	38	50	3	5	10	10	25	25	22E	2	2	**3RT2028-1●●●4-3MA0**	**3RT2028-2●●●4-3MA0**
S2	40	60	3	7 ½	10	15	30	40	22E	2	2	**3RT2035-1●●●4-3MA0**	**3RT2035-3●●●4-3MA0**
	50	70	3	10	15	15	40	50	22E	2	2	**3RT2036-1●●●4-3MA0**	**3RT2036-3●●●4-3MA0**
	65	80	5	10	20	20	50	50	22E	2	2	**3RT2037-1●●●4-3MA0**	**3RT2037-3●●●4-3MA0**
	80[4]	90	5	15	20	25	50	60	22E	2	2	**3RT2038-1●●●4-3MA0**	**3RT2038-3●●●4-3MA0**
S3	80	120	7 ½	15	25	30	60	75	22E	2	2	**3RT2045-1●●●4-3MA0**	**3RT2045-3●●●4-3MA0**
	95	120	10	20	30	30	75	100	22E	2	2	**3RT2046-1●●●4-3MA0**	**3RT2046-3●●●4-3MA0**
S6	150	185	--	30	50	60	125	150	22E	2	2	**3RT1055-6●●●6-3PA0**	—
	185	215	--	30	60	75	150	200	22E	2	2	**3RT1056-6●●●6-3PA0**	—
S10	225	275	--	--	60	75	150	200	22E	2	2	**3RT1064-6●●●6-3PA0**	—
	265	330	--	--	75	100	200	250	22E	2	2	**3RT1065-6●●●6-3PA0**	—
	300	330	--	--	100	125	250	300	22E	2	2	**3RT1066-6●●●6-3PA0**	—

Control circuit coil options: Replace ●●● with the desired code

Frame Size S00 - S0	●●●	Frame Size S2	●●●	Frame Size S3	●●●	Frame Size S6 - S10	●●●
120 V AC	**AK6**	120 V AC	**AK6**	120 V AC **	**AK6**	23 … 26 V UC*, conventional coil	**AB3**
120 V AC, integrated varistor	**CK6**	120 V AC w/ Varistor	**CK6**	24V DC	**KB4**	21-27 V UC*, solid state coil w/ PLC interface	**NB3**
230 V AC	**AP0**	24 V DC w/Varistor	**KB4**	w/ integrated varistor			
24 V DC	**BB4**			24V AC/DC w/integrated varistor	**NB3**	110 … 127 V UC*, conventional coil	**AF3**
24 V DC, integrated varistor	**DB4**					*UC coil: accepts DC voltage or AC voltage, 40 to 60 Hz.	
24 V DC, integrated diode assy.	**FB4**						

Frame Size	Max. current at 240 V [2]	Rated control supply voltage U_s	Auxiliary contacts Indent. No.	NO	NC	Screw Terminals [3] Order No.	Spring Terminals [3] Order No.
	A						
Control relays with permanently mounted auxiliary contact blocks							
S00-S00	**10**	110 V AC, 50 Hz / 120 V AC, 60 Hz	44E	4	4	**3RH2244-1AK60**	**3RH2244-2AK60**
	10	24 V DC	44E	4	4	**3RH2244-1BB40**	**3RH2244-2BB40**
	10	110 V AC, 50 Hz / 120 V AC, 60 Hz	62E	6	2	**3RH2262-1AK60**	**3RH2262-2AK60**
	10	24 V DC	62E	6	2	**3RH2262-1BB40**	**3RH2262-2BB40**

For other voltages see page 2/51.
For accessories, see pages 2/75-2/80.
For spare parts, see pages 2/96-2/99.
For technical data, see pages 2/123-2/144.
For description, see pages 2/106-2/107.
For int. circuit diagrams, see page 2/192-2/198.
For dimension drawings, see pages 2/211-2/218.

1) All terminals are spring loaded on frame size S00 and S0. Only the coil and auxiliary contact terminals are spring loaded on frame sizes S2 & S3.

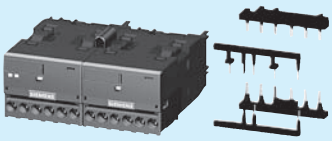
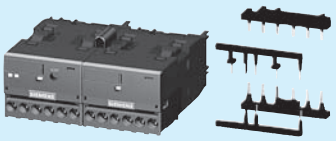
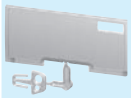
2) For AC-15/AC-14, max current for front mounted auxiliary contacts = 6 A.

3) The 3RH22 control relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4", e. g. 3RH2244-4AK60

4) Max UL FLA = 65A at 460V

Overview

The function modules for mounting onto contactors enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking, and can be connected to the control system by either parallel wiring or through IO-Link or AS-Interface.

Version	SIRIUS function modules for parallel wiring	SIRIUS function modules for IO-Link[1]	SIRIUS function modules for AS-Interface[1]
For direct-on-line starting	Timing relays: ON or OFF-delay with semiconductor output With screw or spring-type terminals 	With screw or spring-type terminals 	With screw or spring-type terminals 
For reversing starting	Wiring modules for sizes S00, S0 & S2 With screw or spring-type terminals · (with screw terminals for main and control circuit) 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules[1] 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules[1] 
For wye-delta starting	1 function module for size S00, S0 & S2, screw and spring-type connection of the contactors, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules[2] 
Accessories	Sealable covers 	Operator panel for autonomous controlling of up to 4 starters Module connector for the grouping of starters Connection cable between the operator panel and the starter group Sealable covers 	AS-Interface addressing units Sealable covers 

1) Use of the communication-capable function modules for IO-Link or AS-Interface requires contactors with communication interface (see pages 2/28).

2) The modules for the control current wiring, which are included in the wiring kit, are not required.

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

Overview

Simply by being plugged in place, the SIRIUS function modules enable different functionalities required for the assembly of starters to be realized in the starter. The function modules and wiring kits help to reduce the wiring work within the starter practically to zero.

SIRIUS function modules for direct-on-line starting

The electronic timing relays which can be mounted onto the contactor are available in these versions:

- Sizes S00 and S0 for applications in the range from 24 to 240 V AC/DC (wide voltage range)
- Size S2 for applications in either the range from 24 to 90 V AC/DC or 90 to 240 V AC/DC

Both the electrical and mechanical connection are made by simple snapping on and locking.

A protection circuit (varistor) is integrated in each module.

The electronic timing relay with semiconductor output uses two contact legs to actuate the contactor underneath by means of a semiconductor after the set time *t* has elapsed.

The switching state feedback is performed by a mechanical switching state indicator (plunger). In addition, the auxiliary switches in the contactors are freely accessible and can be used for feedbacks to the control system or for signal lamps.

A sealable cover is available to protect against careless adjustment of the set times.

SIRIUS function modules for reversing starting

The wiring kits for reversing starters enable the cost-effective assembly of contactor assemblies. They can be used for all applications with reversing duty up to 50 HP.
For a detailed description see page 2/39.

SIRIUS function modules for wye-delta starting

Both interlocking and timing functions are required for the assembly of wye-delta starters. With the function modules for wye-delta starting and the matching link modules for the main circuit, these starters can be assembled easily and with absolutely no errors.

The entire sequence in the control circuit is integrated in the snap-on modules. This covers:

- An adjustable wye time *t* from 0.5 to 60 s
- A non-adjustable dead interval of 50 ms
- Electrical contacting to the contactors by means of coil pick-off (contact legs)
- Feedback of the switching state at the contactor using a mechanical switch position indicator (plunger)
- Electrical interlocking between the contactors

These modules do not require their own terminals and can therefore be used for contactors with both screw and spring-type terminals in the S00, S0 and S2. To start the wye-delta starter, only the first of the three contactors (line contactor) is actuated. All other functions then take place inside the individual modules.

This also offers advantages if the timing function was previously implemented in a controller, as it again results in a significant reduction in the number of PLC outputs, the programming work and the wiring outlay.

The kits for the main circuit include the mechanical interlock, the star jumper, the wiring modules at the top and at the bottom, and the required connecting clips.

A protection circuit (varistor) is integrated in the basic module.

Application

The snap-on function modules for direct-on-line starting are used above all for realizing timing functions independently of the control system.

With the OFF-delay variant of the timing relay it is possible for example for the fan motor for cooling a main drive to be switched off with a delay so that sufficient cooling after operation is guaranteed even if the plant and its control system have already been switched off.

The ON-delay timing relays enable for example the time-delayed starting of several drives so that the summation starting current does not rise too high, which could result in voltage failure.

The function modules for wye-delta starting are mostly used where current-limiting measures for starting a drive are required, e.g. for large fans and ventilators, and a high level of availability is essential at the same time. This technology has been used with success for several decades and has the additional advantage of requiring relatively little know-how. Through the use of function modules, the assembly work with simple standard components is even easier and error-free.

Benefits

The use of snap-on function modules for direct-on-line starting (timing relays) results in the following advantages:

- Reduction of control current wiring
- Prevention of wiring errors
- Reduction of testing costs
- Implementation of timing functions independently of the control system
- Less space required in the control cabinet compared to a separate timing relay
- No additive protection circuit required (varistor integrated)

The use of function modules for wye-delta starting results in the following advantages:

- Operation solely through the line contactor A1/A2 – no further wiring needed
- Reduction of the control current wiring inside the contactor assembly and to the higher-level control system where applicable
- Prevention of wiring errors
- Reduction of testing costs
- Integrated electrical interlocking saves costs and prevents errors
- Less space needed in the control cabinet compared to using a separate timing relay
- Adjustable starting in star mode from 0.5 to 60 s
- Independent of the contactor's control supply voltage (24 to 240 V AC/DC)
- Varistor integrated – no additive protection circuit required
- No control current wiring thanks to plug-in technology and connecting cables
- Mechanically coded assembly enables easy configuration and reliable wiring
- Fewer versions – one module kit for screw and spring-type connection and for the two sizes S00 to S2
- Mechanical interlocking (with wiring kit for the main circuit)

Selection and ordering data

- Ideal for diagnostics to the automation controller
- Quickly locate and rectify faults
- Configuration available in Step 7 and TIA Portal
- Easy engineering of parameters
- For DOL, reversing and wye delta starters up to 50 HP
- Manual starter operation with optional operator panel
- Reduces control wiring in the panel
- Available for 24VDC control systems
- Easily snap on IO-Link or AS-Interface modules onto contactors

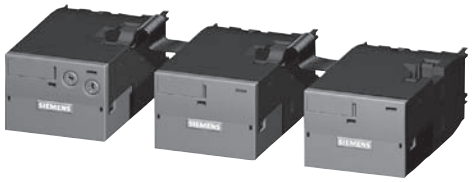
	Frame Size	Amp Ratings AC3	Amp Ratings AC1	Single-phase HP ratings 115V	Single-phase HP ratings 230V	Three-phase HP ratings 208V	Three-phase HP ratings 230V	Three-phase HP ratings **460V**	Three-phase HP ratings 575V	Auxiliary contacts NO	Auxiliary contacts NC	**Screw Terminals 24 V DC coil** Order No.	**Spring-type Terminals 1) 24 V DC coil** Order No.	Weight approx. kg
3RT 3-pole Contactors														
 3RT2018-1BB41-0CC0	**S00**	**7**	18	0.25	0.75	1.5	2	**3**	5	1	0	**3RT2015-1BB41-0CC0**	**3RT2015-2BB41-0CC0**	0.28
										0	1	**3RT2015-1BB42-0CC0**	**3RT2015-2BB42-0CC0**	
		9	22	0.33	1	2	3	**5**	7.5	1	0	**3RT2016-1BB41-0CC0**	**3RT2016-2BB41-0CC0**	
										0	1	**3RT2016-1BB42-0CC0**	**3RT2016-2BB42-0CC0**	
		12	22	0.5	2	3	3	**7.5**	10	1	0	**3RT2017-1BB41-0CC0**	**3RT2017-2BB41-0CC0**	
										0	1	**3RT2017-1BB42-0CC0**	**3RT2017-2BB42-0CC0**	
		16	22	1	2	3	5	**10**	10	1	0	**3RT2018-1BB41-0CC0**	**3RT2018-2BB41-0CC0**	
										0	1	**3RT2018-1BB42-0CC0**	**3RT2018-2BB42-0CC0**	
 3RT2028-1BB40-0CC0	**S0**	**9**	40	1	1	2	3	**5**	7.5	1	1	**3RT2023-1BB40-0CC0**	**3RT2024-2BB40-0CC0**	0.58
		12	40	1	2	3	3	**7.5**	10	1	1	**3RT2024-1BB40-0CC0**	**3RT2024-2BB40-0CC0**	
		16	40	1	3	5	5	**10**	15	1	1	**3RT2025-1BB40-0CC0**	**3RT2025-2BB40-0CC0**	
		25	40	2	3	7.5	7.5	**15**	20	1	1	**3RT2026-1BB40-0CC0**	**3RT2026-2BB40-0CC0**	
		32	50	2	5	10	10	**20**	25	1	1	**3RT2027-1BB40-0CC0**	**3RT2027-2BB40-0CC0**	
		38	50	3	5	10	10	**25**	25	1	1	**3RT2028-1BB40-0CC0**	**3RT2028-2BB40-0CC0**	
 3RT2038-1NB30-0CC0	**S2**	**40**	60	3	7.5	10	15	**30**	40	1	1	**3RT2035-1NB30-0CC0**	**3RT2035-3NB30-0CC0**	1.122
		50	70	3	10	15	15	**40**	50	1	1	**3RT2036-1NB30-0CC0**	**3RT2036-3NB30-0CC0**	
		65	80	5	10	20	20	**50**	50	1	1	**3RT2037-1NB30-0CC0**	**3RT2037-3NB30-0CC0**	
		80	90	5	15	20	25	**50**	60	1	1	**3RT2038-1NB30-0CC0**	**3RT2038-3NB30-0CC0**	

1) All terminals are spring loaded in sizes S00 and S0.
For size S2, only the coil and aux contacts are spring loaded.

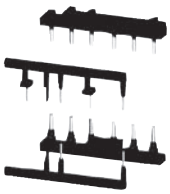
Communication capable contactors are ideal for starter feedback to the automation level. IO-Link starters in the cabinet save considerable wiring effort. AS-Interface is best suited for distributed systems.

For reversing contactors with communication capability, see pages 2/41-2/45
For accessories, see page 2/29, 2/32, 2/36.
For technical data, see page 2/33, 2/37, 2/38
For description, see page 2/26.
For further information on IO-Link and AS-Interface, see page 2/30-2/31 and 2/34-2/35.

Selection and ordering data



3RA28 16-0EW20



3RA29 13-2AA1

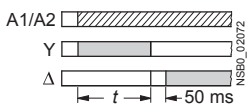
3RA29 13-2BB2

For contactors	Rated control supply voltage U_s [1]	Time setting range t	Screw terminals	Weight approx.	Spring-type [2] terminals	Weight approx.
Type	V	s	Order No.	kg	Order No.	kg
Assembly kits for reversing starting						
	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: Mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom					
3RT20 1.	• For size S00		**3RA29 13-2AA1**	0.046	**3RA29 13-2AA2**	0.070
3RT20 2.	• For size S0		**3RA29 23-2AA1**	0.089	**3RA29 23-2AA2**	0.112
3RT20 3.	• For size S2 (w/o mechanical interlock, see pg. 2/45)		**3RA29 33-2AA1**	0.159	**3RA29 33-2AA2**	0.156
Assembly kits for wye-delta starting						
	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: Mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom					
3RT20 1.	• For size S00		**3RA29 13-2BB1**	0.051	**3RA29 13-2BB2**	0.080
3RT20 2.	• For size S0 (only main circuit for version with spring-type terminals)		**3RA29 23-2BB1**	0.099	**3RA29 23-2BB2**	0.133
3RT20 3.	• For size S2 (only main circuit for version with spring-type terminals)		**3RA29 33-2BB1**	0.242	**3RA29 33-2BB2**	0.182
Function modules for wye-delta starting						
	The electrical connection between the function module and the contactor assembly is established automatically by snapping on and plugging in the connecting cables. **Wye-delta function** (varistor integrated)					
3RT20 1. 3RT20 2. 3RT20 3.	24 ... 240 AC/DC	0.5 ... 60 (10, 30, 60 selectable)	**3RA28 16-0EW20**	0.170	**3RA28 16-0EW20**	0.170
Accessories						
	Sealable covers for 3RA27, 3RA28, 3RA29		**3RA29 10-0**	0.002	**3RA29 10-0**	0.002

1) AC voltage values apply for 50 Hz and 60 Hz.

2) Assembly kits in sizes S0 and S2 are supplied with wiring modules for the main circuit only.

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

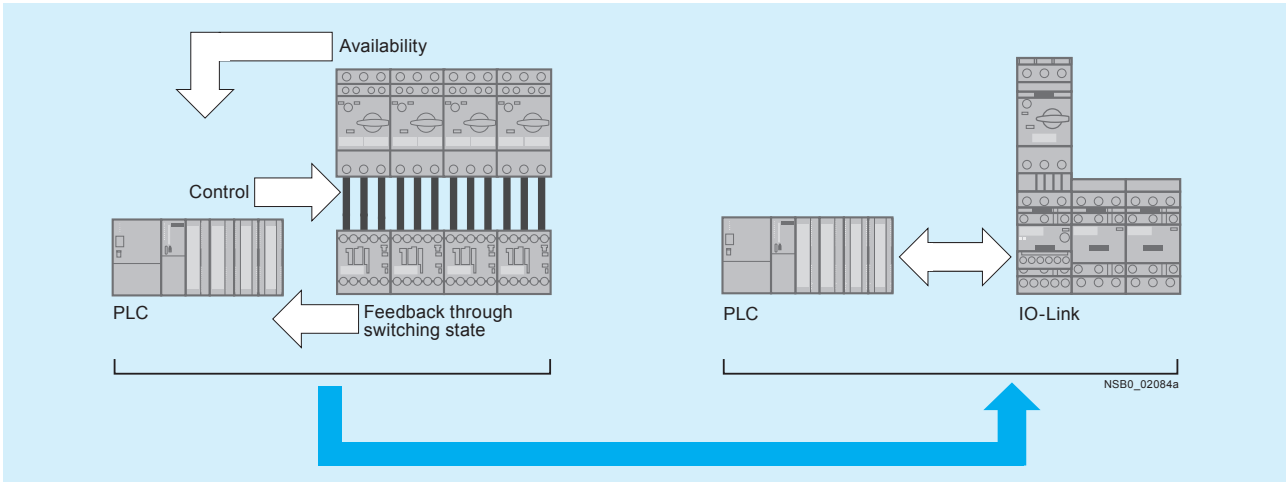
Function	Function charts
	Timing relay energized
	Contact closed
	Contact open
2 NO contacts (internally connected)	
Wye-delta function (varistor integrated) • 1 NO contact, delayed • 1 NO contact, instantaneous	3RA28 16-0EW20 

Overview

The SIRIUS function modules for IO-Link enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additive protection circuit for the individual contactors can be dispensed with completely, and feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. The starters are connected to the higher-level control system through IO-Link, with the possibility of connecting up to four starters as a group to one port of the IO-Link master.

Through this type of connection to the control system, a maximum of wiring is saved. The following essential signals are transmitted:

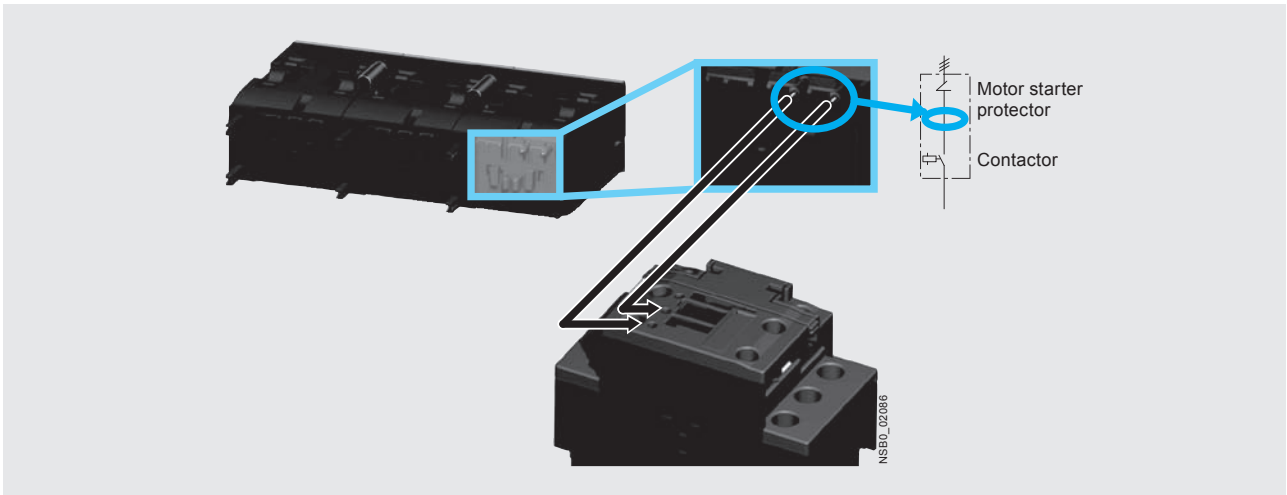
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through IO-Link

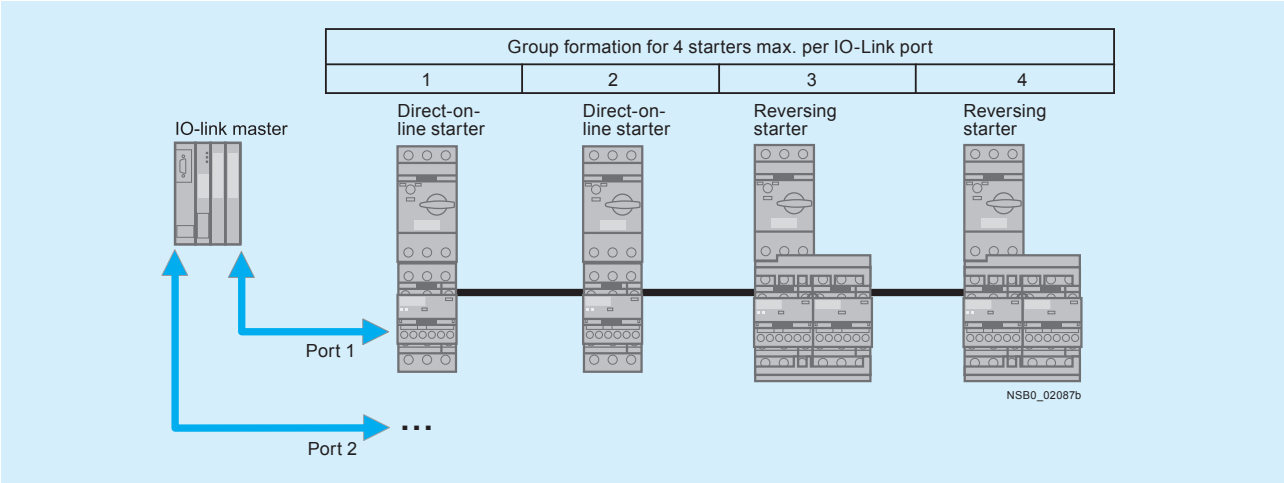
The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires the use of communication versions of the contactors with communication interface (see page 2/28).



Availability signal through voltage pick-off

By grouping up to four starters it is possible to connect up to 16 starters to one master of the ET200S. All the signals of the individual controls are made available through only 3 individual wires per starter group directly in the process image. If the potential at the master of the ET200S is the same as that of the controls, a further reduction in wiring is possible by providing the control supply voltage to the contactors by jumpering the corresponding communication wires.



Group formation with IO-Link

In case of a malfunction, the corresponding error signals are also sent directly to the PLC in acyclic mode. This is in addition to transmission of the switching signals and status signals.

Possible error signals:

- Device defect
- No main voltage (motor starter protector tripped)
- No control supply voltage
- Limit position on the right / on the left
- Manual mode
- Process image fault

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Local manual operation of the complete starter group is also straight-forward using a operator panel. The latter is easily connected to the last starter and can be built into the front panel of the control cabinet if required. This offers significant advantages particularly for commissioning.

Application

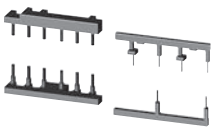
The use of SIRIUS function modules with IO-Link is recommended above all in machines and plants in which there are several motor starters in one control cabinet. Using IO-Link, the connection of these starters to the automation level is easy, quick and error-free. And with IO modules no longer needed, the width of the ET200S becomes far smaller.

Benefits

- Reduction of the control current wiring to no more than one cable having three conductors for four starters
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA for clear diagnostics if a fault occurs
- Fewer IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

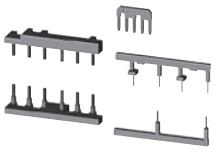
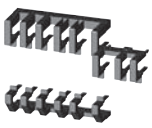
Further information on the application and benefits of the SIRIUS function modules for connection to the control system through IOLink can be found in Chapter 14 “Industrial Communication”.

Selection and ordering data

	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
 3RA2711-1AA00	**IO-Link connection** Includes one module connector for assembling an IO-Link group	**3RA2711-1AA00**	**3RA2711-2AA00**	
 3RA2711-2AA00				
Function modules for reversing starting[1]				
 3RA2711-1BA00	**IO-Link connection**, comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group	**3RA2711-1BA00**	**3RA2711-2BA00**	
 3RA2711-2BA00				
 3RA2923-2AA1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2AA1**	**3RA2913-2AA2**	
	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2AA1**	--	
	- Only for main circuit[2]	--	**3RA2923-2AA2**	
 3RA2923-2AA2	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2AA1**	--	
	- Only for main circuit[2]	--	**3RA2933-2AA2**	

1) For prewired contactor assemblies for reversing starting with voltage tap-off, see pages 2/42 and 2/45. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.
2) Version in sizes S0 and S2 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

Matching contactors with communications interface required; see pages 2/26.

	Version	Screw terminals Order No.	Spring-type terminals Order No.	Weight kg
Function modules for wye-delta starting[1]				
 3RA2711-1CA00	**IO-Link connection**, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group	**3RA2711-1CA00**	**3RA2711-2CA00**	
 3RA2923-2BB1	**Assembly kits for making 3-pole contactor assemblies**[2] The assembly kit contains: mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2BB1**	**3RA2913-2BB2**	
 3RA2923-2BB2	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2BB1**	**--**	
	- Only for main circuit[3]	**--**	**3RA2923-2BB2**	
	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2BB1**	**--**	
	- Only for main circuit[3]	**--**	**3RA2933-2BB2**	

Matching contactors with communications interface required; see pages 2/28.

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/49 and 2/50.
2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required.
3) Version in sizes S0 and S2 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

	Version	Order No.	Weight kg
Accessories			
 3RA2711-0EE10	**Module connector set**, comprising: • 2 module connectors, 14-pole, short • 2 interface covers	**3RA2711-0EE10**	
	Module connectors		
 3RA2711-0EE06	• 14-pole, 9 cm For size jump + 1 space	**3RA2711-0EE06**	
	• 14-pole, 26 cm For various space combinations	**3RA2711-0EE07**	
	• 14-pole, 33.5 cm For various space combinations	**3RA2711-0EE08**	
 3RA2711-0EE15	• 10-pole, 9 cm For separate control signal infeed within an IO-Link group	**3RA2711-0EE16**	
	Interface covers (Set of 5)	**3RA2711-0EE15**	
 3RA2910-0	**Sealable covers** For 3RA27, 3RA28, 3RA29	**3RA2910-0**	
Operator panels[1]			
 3RA6935-0A	**Operator panel (set)**, comprising: • 1 x operator panel • 1 x enabling module • 1 x interface cover • 1 x fixing terminal	**3RA6935-0A**	
 3RA2711-0EE11	**Connection cable**, length 2 m, 10- to 14-pole For connecting the operator panel to the communication module	**3RA2711-0EE11**	
	Enabling modules (replacement)	**3RA6936-0A**	
	Interface covers (replacement)	**3RA6936-0B**	

1) Suitable only for communication through IO-Link.

For manuals, see
http://support.automation.siemens.com/WW/view/en/39319600.

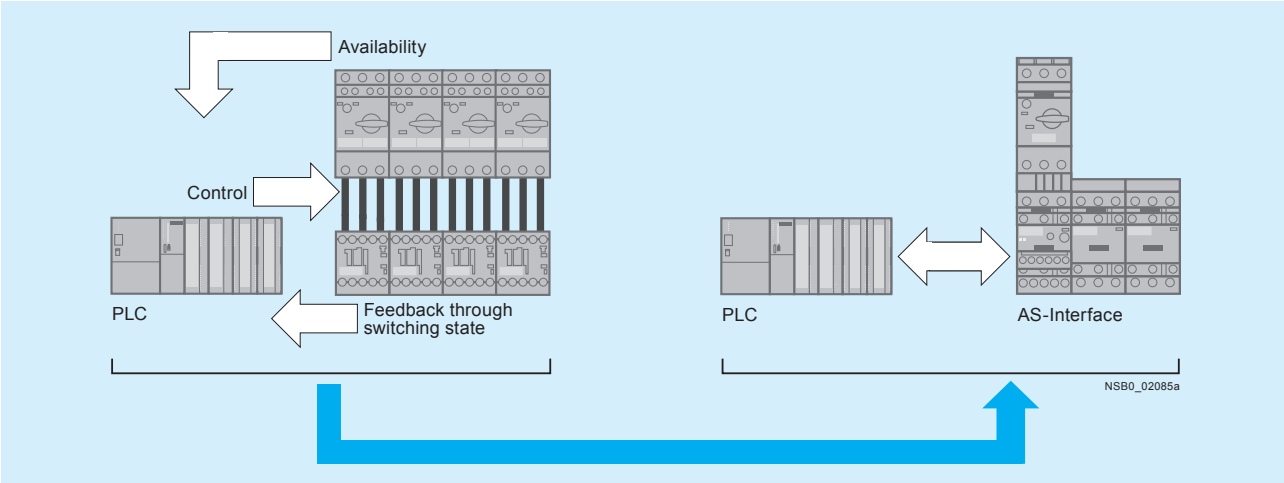
Overview

The SIRIUS function modules for AS-Interface enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additional control circuit for the individual contactors can be eliminated with completely because a varistor is integrated in the modules. Feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. Connection of the starters to the higher-level control system takes place through AS-Interface with the Specification V2.1 in A/B technology. As the result, up to 62 starters can be connected to one master and the address is entered in normal manner with an addressing unit.

Through the AS-Interface connection to the control system, a maximum of wiring is saved. The wiring outlay is reduced to the control supply voltage and the two individual wires for AS-Interface.

The following essential signals are transmitted:

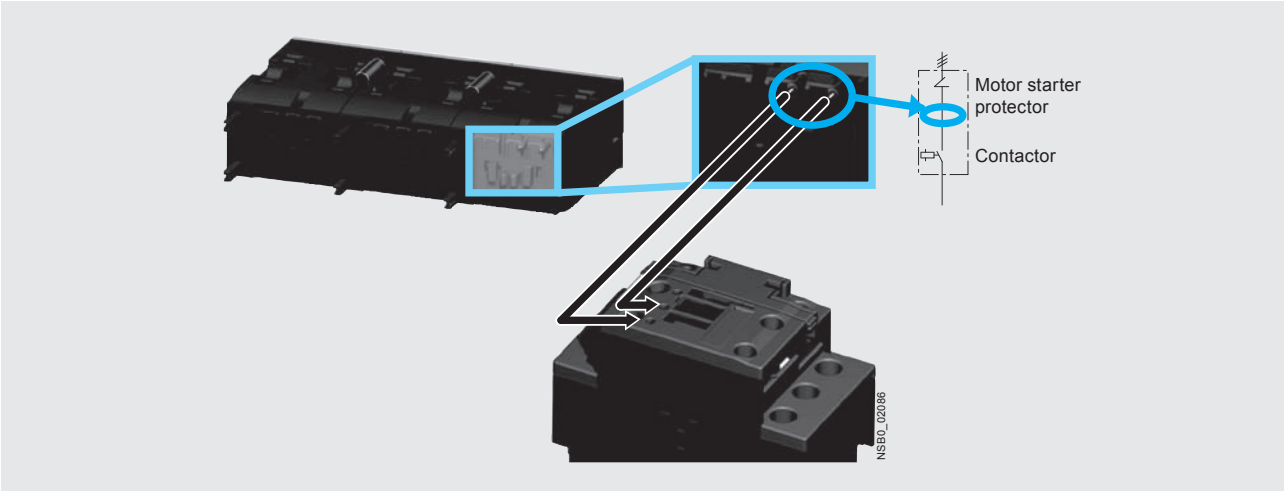
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



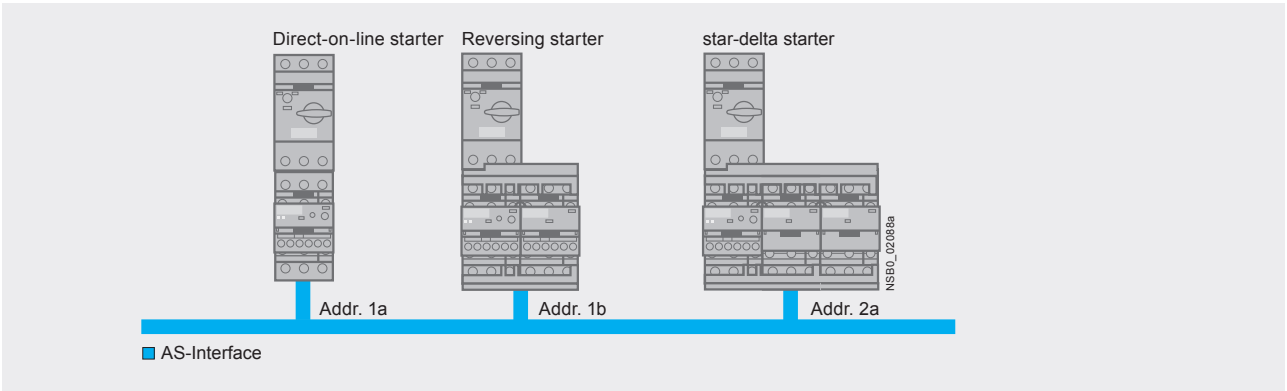
Signal transmission through AS-Interface

The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires use of communication versions of the contactors with communication interface (see page 2/28).



Availability signal through voltage pick-off



Topology with AS-Interface

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example, to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

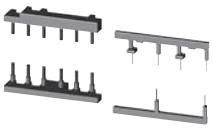
Application

The use of SIRIUS function modules with AS-Interface is recommended above all in machines and plants requiring easy connection of several different sensors and actuators both inside and outside the control cabinet to the higher-level control system. And with IO modules no longer needed, the width of the PLC is far smaller.

Benefits

- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Elimination of IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

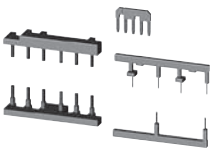
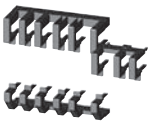
Selection and ordering data

	Version	Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
 3RA2712-1AA00	**AS-Interface connection**	**3RA2712-1AA00**	**3RA2712-2AA00**	
 3RA2712-2AA00				
Function modules for reversing starting[1]				
 3RA2712-1BA00	**AS-Interface connection**, comprising one basic and one coupling module	**3RA2712-1BA00**	**3RA2712-2BA00**	
 3RA2712-2BA00				
 3RA2923-2AA1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2AA1**	**3RA2913-2AA2**	
	• For size S0			
	- For main, auxiliary and control current	**3RA2923-2AA1**	**--**	
	- Only for main current	**--**	**3RA2923-2AA2**	
  3RA2923-2AA2	• For size S2			
	- For main, auxiliary and control current	**3RA2933-2AA1**	**--**	
	- Only for main current	**--**	**3RA2933-2AA2**	

Matching contactors with communications interface required; see page 2/28.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 “Industrial Communication”.

1) For prewired contactor assemblies for reversing starting with communication interface, see pages 2/42 and 2/45. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

	Version	Screw terminals Order No.	Spring-type terminals Order No.	Weight kg
Function modules for wye-delta starting[1]				
 3RA2712-1CA00	**AS-Interface connection**, comprising one basic module and two coupling modules	**3RA2712-1CA00**	**3RA2712-2CA00**	
 3RA2712-2CA00				
 3RA2923-2BB1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom			
	• For size S00	**3RA2913-2BB1**	**3RA2913-2BB2**	
 3RA2923-2BB2	• For size S0			
	- For main, auxiliary and control circuits	**3RA2923-2BB1**	--	
	- Only for main circuit	--	**3RA2923-2BB2**	
	• For size S2			
	- For main, auxiliary and control circuits	**3RA2933-2BB1**	--	
	- Only for main circuit	--	**3RA2933-2BB2**	

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/49 and 2/50.

Matching contactors with communications interface required; see page 2/28.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 “Industrial Communication”.

	Version	Order No.	Weight kg
Accessories			
 3RA2711-0EE10	**Module connector set**, comprising: • 2 module connectors, 14-pole, short • 2 interface covers	**3RA2711-0EE10**	
 3RA2711-0EE06	**Module connectors** • 14-pole, 9 cm For size jump + 1 space	**3RA2711-0EE06**	
 3RA2711-0EE15	**Interface covers** (Set of 5)	**3RA2711-0EE15**	
 3RA2910-0	**Sealable covers** For 3RA27, 3RA28, 3RA29	**3RA2910-0**	

For manuals, see http://support.automation.siemens.com/WW/view/en/39318922.

Technical specifications

Type			3RA2811	3RA2831	3RA2812	3RA2832	3RA2816		
Can be used for size			S00, S0	S2	S00, S0	S2	S00, S0, S2		
Function			ON-delay		OFF-delay with control signal		Wye-delta function		
General data									
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III		V AC	300						
Rated impulse withstand voltage U_{imp}		kV AC	4						
Operating range of excitation			0.85 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency						
Overvoltage protection			Varistor integrated						
Rated power		W	1				1		
• Power consumption at 230 V AC, 50 Hz		VA	1				2		
DIAZED protection	Operational class gG	A	--				4		
Switching frequency for load									
• With I_e at 230 V AC		h^{-1}	2 500				--		
• With 3RT2 contactor at 230 V AC		h^{-1}	2 500				--		
Recovery time		ms	50				150		
Minimum ON period		ms	--		35		--		
Residual current	Max.	mA	5	--			--		
Voltage drop With conducting output	Max.	VA	3.5	--			--		
Setting accuracy With reference to upper limit of scale	Typ.		±15 %						
Repeat accuracy	Max.		±1 %						
Electrical endurance									
• With 3RT2028 contactor		Operating cycles	100 000				--		
• At AC-15, 250 V, 3 A		Operating cycles	--				100 000		
Mechanical endurance		Operating cycles	100 x 10^6				10 x 10^6		
Permissible ambient temperature									
• During operation		°C	-25 ... +60						
• During storage		°C	-40 ... +80						
Degree of protection acc. to IEC 60947-1, Appendix C			IP20						
Shock resistance Half-sine acc. to IEC 60068-2-27		*g*/ms	15/11						
Vibration resistance According to IEC 60068-2-6		Hz/mm	10 ... 55/0.35						
Electromagnetic compatibility (EMC)			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1, IEC 60947-4-1						
Overvoltage protection			Varistor integrated						
Permissible mounting position			Any (see contactor)						
Conductor cross-sections									
Connection type (1 or 2 conductors can be connected)			**Screw terminals**						
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)				--		
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)				--		
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)				--		
• Terminal screws			M3 (for standard screw driver size 2 or Pozidriv 2)				--		
• Tightening torque		Nm	0.8 ... 1.2				--		
Connection type (1 or 2 conductors can be connected)			**Spring-type terminals**						
• Operating devices		mm	3.0 x 0.5				--		
• Solid		mm^2	2 x (0.25 ... 1.5)				--		
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)				--		
• Finely stranded		mm^2	2 x (0.25 ... 1.5)				--		
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)				--		

Design

Complete equipment assemblies

The fully wired reversing contactor assemblies are suitable for use in any climate. They are safe from touch to EN 50274.

The contactor assemblies each consist of two contactors with identical ratings. The contactors are mechanically and electrically interlocked (NC contact interlock). The main and control circuits are wired according to the circuit diagrams on page 2/201.

For motor protection, either 3RU2 or 3RB3 overload relays for direct mounting or individual mounting or thermistor motor protection tripping units must be ordered separately.

Components for customer assembly

Installation kits for all sizes are available for customer assembly of reversing contactor assemblies.

Contactors, overload relays, the mechanical interlock and — for momentary-contact operation — auxiliary switch blocks for latching must be ordered separately

The following points should be noted:

Size S00

- For maintained-contact operation:
  use contactors with an NC contact in the basic unit for the electrical interlock.
- For momentary-contact operation:
  use contactors with an NC contact in the basic unit for the electrical interlock; in addition, an auxiliary switch block with at least one NO contact for latching is required per contactor.

Size S0 and S2

Contactors come equipped with integrated 1 NO and 1NC aux contacts in each contactor. Both electrical interlocking and latching are satisfied with the integrated auxiliaries. Mechanical interlocking is required in either size and comes in the assembly kits except for size S2 where you need to order 3RA2934-2B interlock separately.

Sizes S3

- For maintained-contact operation:
  the contactors have no auxiliary contact in the basic unit; NC contacts for the electrical interlock are therefore integrated in the mechanical interlock that can be mounted on the side of each contactor (one contact each for the left and right-hand contactors).
- For momentary-contact operation:
  the electrical interlock is the same as for maintained-contact operation; in addition, an auxiliary switch with one NO contact for latching is required per contactor. This contact can be snapped onto the top of the contactors. Alternatively, auxiliary switch blocks mounted on the side can be used; they must be fitted onto the outside of each contactor.

If the front-mounted mechanical interlock is used for size S2 to S3 contactors, two location holes for single-pole auxiliary switch blocks are provided on the front of each S2 contactor while three additional, single-pole auxiliary switch blocks can be snapped onto S3 contactors. The maximum auxiliary switch complements per contactor stated on page 2/14 must not be exceeded.

When size S3 contactors are combined with a frontmounted mechanical interlock, the 3RA19 33-2B and 3RA19 43-2B installation kits cannot be used.

Sizes S6 to S12

To insert the mechanical interlock, the prestamped location holes positioned opposite on the contactor must be knocked out. The internal auxiliary contacts (up to 1 NO + 1 NC per contactor) can be used for the electrical interlock and latching. The mechanical interlock itself does not contain any auxiliary contacts. Additional auxiliary contacts can be used on the outside and front (on the front in the case of 3RT10) of the reversing contactor assembly.

Principle of operation

The operating times of the individual 3RT10/20 contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked via their auxiliary switches (NC contact interlock) and the operating mechanisms. An additional dead interval of 50 ms is necessary on reversing if the individual contactors are used at voltages > 500 V. The operating times of the individual contactors are not affected by the mechanical interlock.

Surge suppression

Sizes S00 to S3

All contactor assemblies can be fitted with RC elements or varistors for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the front of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S3). For sizes S0 and S2, the surge protection fits behind the hinged door on the front of the contactor and does not take up any additional space.

Sizes S6 to S12

The contactors are fitted with varistors as standard.

Overview

The 3RA13 and 3RA23 reversing contactor assemblies can be ordered as follows:

Sizes S00 to S3

- Fully wired and tested, open type, with mechanical and electrical interlock. 1)

Sizes S00 to S12

- As components for customer assembly.

There is also a range of accessories (auxiliary switch blocks, surge suppressors, etc.) that must be ordered separately.

For overload relays for motor protection, see section 3.

The 3RA23 and 3RA13 contactor assemblies have screw connections and are available for screwing or snapping onto 35 mm standard mounting rails. The 3RA23 contactor assemblies are also available with spring-type terminals.

The cULus and UL approvals only apply to the complete contactor assemblies and not to the components for customer assembly.

AC and DC operation

See pages 2/42 through 2/46 for complete part numbers.

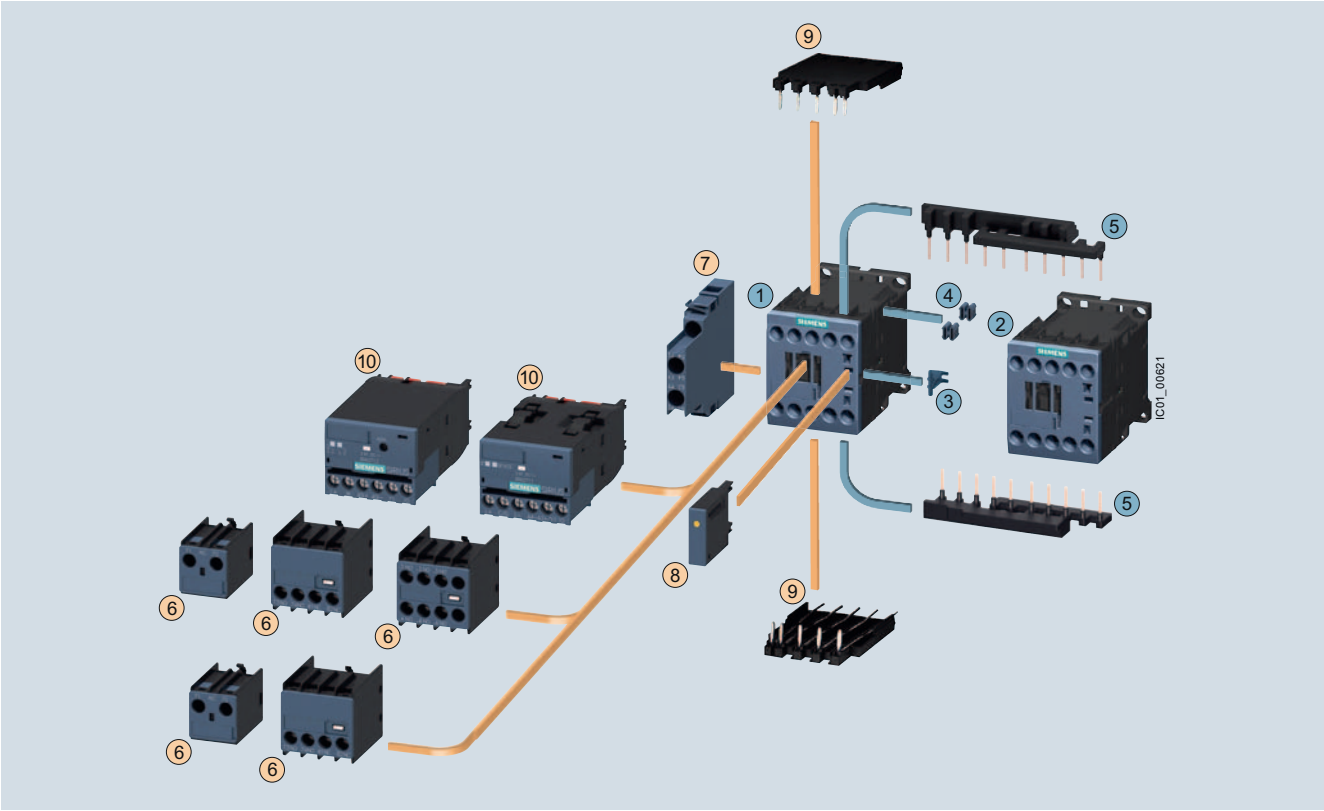
Maximum horsepower rating at 460 V AC	AC-3 maximum inductive current	Size	Order No.					
			Contactor	Mechanical interlock 2)	Mechanical interlock 3)	Mechanical interlock 4)	Installation kit	**Fully wired and tested contactor assembly**
HP	A							
3	7	**S00**	3RT20 15	3RA29 13-2AA1 6)	–	–	3RA29 13-2AA1 6)	**3RA23 15-8XB30- ...**
5	9		3RT20 16					**3RA23 16-8XB30- ...**
7.5	12		3RT20 17					**3RA23 17-8XB30- ...**
10	16		3RT20 18					**3RA23 18-8XB30- ...**
7.5	12	**S0**	3RT20 24	3RA29 23-2AA1 6)	–	–	3RA29 23-2AA1 6)	**3RA23 24-8XB30- ...**
10	16		3RT20 25					**3RA23 25-8XB30- ...**
15	25		3RT20 26					**3RA23 26-8XB30- ...**
20	32		3RT20 27					**3RA23 27-8XB30- ...**
25	38		3RT20 28					**3RA23 28-8XB30- ...**
30	40	**S2**	3RT20 35	3RA29 34-2B	–	–	3RA29 33-2AA1 7)	**3RA23 35-8XB30-1 . .**
40	50		3RT20 36					**3RA23 36-8XB30-1 . .**
50	65		3RT20 37					**3RA23 37-8XB30-1 . .**
50	80		3RT20 38					**3RA23 38-8XB30-1 . .**
50	65	**S3**	3RT20 45	3RA29 34-2B	–	–	3RA29 43-2AA1 8)	**3RA23 45-8XB30-1 . .**
60	80		3RT20 46					**3RA23 46-8XB30-1 . .**
75	95		3RT20 47					**3RA23 47-8XB30-1 . .**
100	115	**S6**	3RT10 54	–	–	3RA19 54-2A	3RA19 53-2A 9)	**–**
125	150		3RT10 55					
150	185		3RT10 56					
150	225	**S10**	3RT10 64	–	–	3RA19 54-2A	3RA19 63-2A 9)	**–**
200	265		3RT10 65					
250	300		3RT10 66					
300	400	**S12**	3RT10 75	–	–	3RA19 54-2A	3RA19 73-2A 9)	**–**
400	500		3RT10 76					

For accessories, see page 2/82-2/85.
For circuit diagrams, see page 2/201.
For dimension drawings, see page 2/221-2/223.

1) An additional dead interval of 50 ms is necessary on reversing at voltages > 500 V.
2) Laterally mountable with one auxiliary contact (except no auxiliary contact in S2 & S3)
3) For front mounting with one auxiliary contact.
4) Laterally mountable without auxiliary contact.
5) Interlock must be ordered with installation kit.
6) Installation kit contains: mechanical interlock; 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.
7) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom and the mechanical interlock.
8) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.
9) Installation kit contains: wiring connector on the top and bottom.

Fully wired and tested reversing contactor assemblies · Size S00 – Up to 10 HP

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately		Type
6	Auxiliary switch block, front[1]	3RH2911
7	Auxiliary switch block, lateral	3RH2921
8	Surge suppressors	3RT2916
9	Solder pin adapters	3RT1916-4KA1
10	Function module for connection to the control system	3RA271.-1BA00

Complete reversing contactor assembly

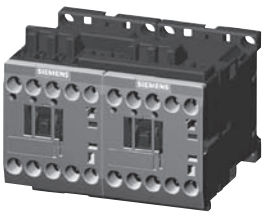
Individual parts		Type Q11	Type Q12
1 2	Contactors, 3 kW	3RT2015	3RT2015
1 2	Contactors, 4 kW	3RT2016	3RT2016
1 2	Contactors, 5.5 kW	3RT2017	3RT2017
1 2	Contactors, 7.5 kW	3RT2018	3RT2018
3 ... 5	Assembly kit comprising:	3RA2913-2AA1	
	3 Mechanical interlock[2]		
	4 Two connecting clips for two contactors[2]		
	5 Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included[3], interruptible (NC contact interlock)		

1) Auxiliary switch block according to EN 50005 must be used.

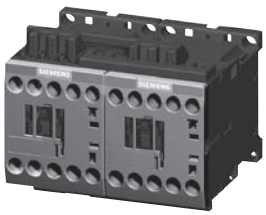
2) The parts 3 and 4 can only be ordered together as 3RA2912-2H mechanical connectors.

3) 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

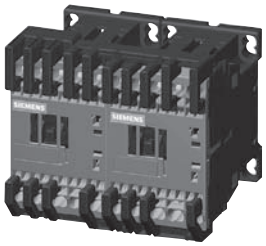
Fully wired and tested contactor assemblies[2] · Size S00 · Up to 10 HP



3RA23 18-8XE30-1BB4



3RA23 1.-8XB30-1A..



3RA23 1.-8XB30-2A..

AC data	UL data									Screw terminals	Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage U_s at 50/60 Hz	Auxiliary contacts		Spring-type terminals	
AC2/AC3	115 V	230 V	200 V	230 V	**460 V**	575 V		NO	NC	Order No.	
							V				kg
AC operation, 50/60 Hz											
Size S00[1]											
7	1/4	3/4	1 1/2	2	3	5	24 AC	0	2	**3RA23 15-8XB30-□AB0**	0.46/0.50
7	1/4	3/4	1 1/2	2	3	5	110/120 AC	0	2	**3RA23 15-8XB30-□AK6**	0.46/0.50
7	1/4	3/4	1 1/2	2	3	5	220/240 AC	0	2	**3RA23 15-8XB30-□AP6**	0.46/0.50
9	1/3	1	2	3	5	7 1/2	24 AC	0	2	**3RA23 16-8XB30-□AB0**	0.46/0.50
9	1/3	1	2	3	5	7 1/2	110/120 AC	0	2	**3RA23 16-8XB30-□AK6**	0.46/0.50
9	1/3	1	2	3	5	7 1/2	220/240 AC	0	2	**3RA23 16-8XB30-□AP6**	0.46/0.50
12	1/2	2	3	3	7 1/2	10	24 AC	0	2	**3RA23 17-8XB30-□AB0**	0.46/0.50
12	1/2	2	3	3	7 1/2	10	110/120 AC	0	2	**3RA23 17-8XB30-□AK6**	0.46/0.50
12	1/2	2	3	3	7 1/2	10	220/240 AC	0	2	**3RA23 17-8XB30-□AP6**	0.46/0.50
16	1	2	3	5	10	10	24 AC	0	2	**3RA23 18-8XB30-□AB0**	0.46/0.50
16	1	2	3	5	10	10	110/120 AC	0	2	**3RA23 18-8XB30-□AK6**	0.46/0.50
16	1	2	3	5	10	10	220/240 AC	0	2	**3RA23 18-8XB30-□AP6**	0.46/0.50
DC operation											
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	**3RA23 15-8XB30-□BB4**	0.58/0.62
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	**3RA23 16-8XB30-□BB4**	0.58/0.62
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	**3RA23 17-8XB30-□BB4**	0.58/0.62
16	1	2	3	5	10	10	24 DC	0	2	**3RA23 18-8XB30-□BB4**	0.58/0.62
With communication interface[3]											
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	**3RA23 15-8XE30-□BB4**	0.58/0.62
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	**3RA23 16-8XE30-□BB4**	0.58/0.62
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	**3RA23 17-8XE30-□BB4**	0.58/0.62
16	1	2	3	5	10	10	24 DC	0	2	**3RA23 18-8XE30-□BB4**	0.58/0.62

Screw terminals	**1**
Spring-loaded terminals	**2**

For other voltages see page 2/51

For accessories and spare parts, see page 2/68-2/85.

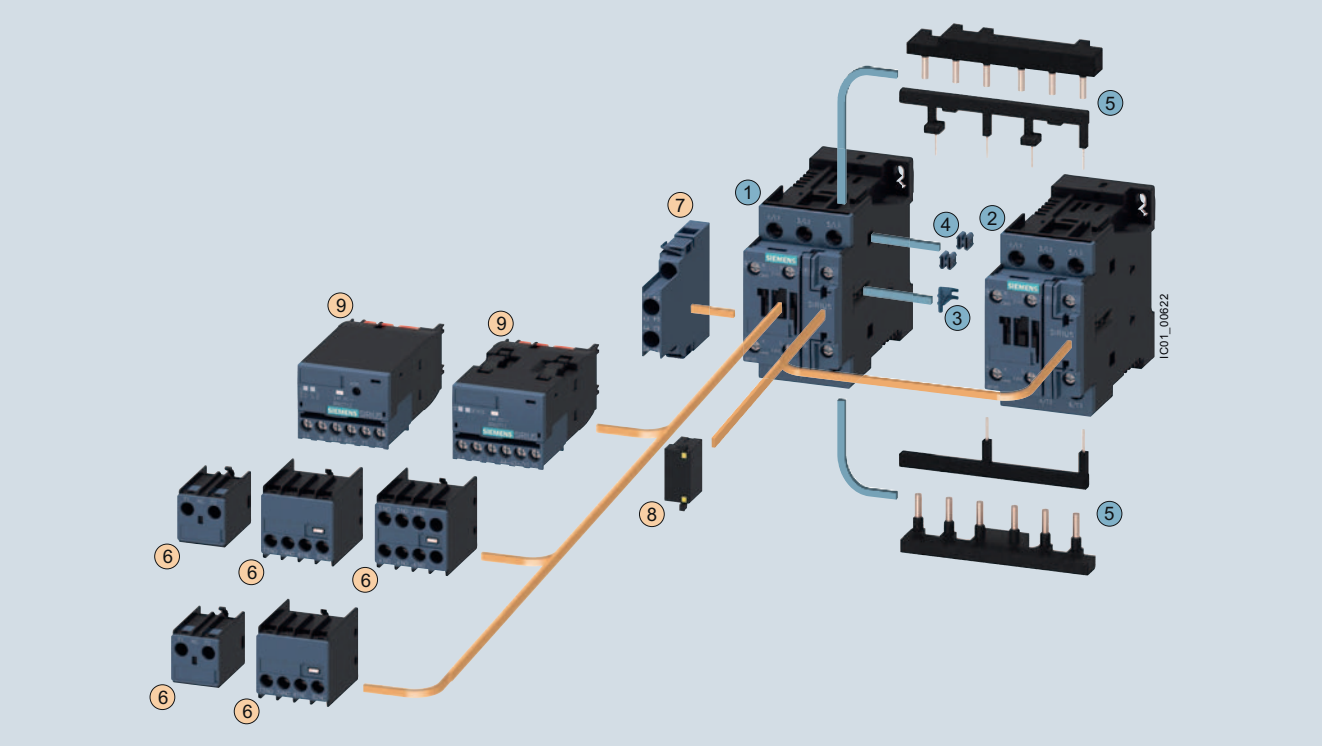
1) For coil operating range, see page 2/51.

2) The contactors integrated in the contactor assemblies have no unassigned auxiliary contacts.

3) For use with 3RA27 and 3RA28 communication modules. See pages 2/26 to 2/33.

Fully wired and tested reversing contactor assemblies · Size S0 – Up to 25 HP

The figure shows the version with screw terminals



Mountable accessories (optional)

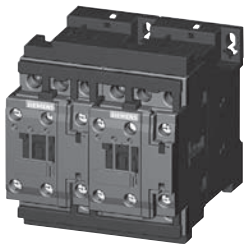
To be ordered separately		Type
6	Auxiliary switch block, front	3RH2911
7	Auxiliary switch block, lateral	3RH2921
8	Surge suppressors	3RT2926
9	Function module for connection to the control system	3RA271.-1BA00

[1] The parts 3 and 4 can only be ordered together as 3RA2922-2H mechanical connectors.

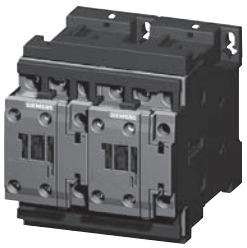
Complete reversing contactor assembly

Individual parts		Type Q11	Type Q12
1 2	Contactors, 5.5 kW	3RT2024	3RT2024
1 2	Contactors, 7.5 kW	3RT2025	3RT2025
1 2	Contactors, 11 kW	3RT2026	3RT2026
1 2	Contactors, 15 kW	3RT2027	3RT2027
1 2	Contactors, 18.5 kW	3RT2028	3RT2028
3 ... 5	Assembly kit comprising:	3RA2923-2AA1	
	3 Mechanical interlock[1]		
	4 Two connecting clips for two contactors[1]		
	5 Wiring modules on the top and bottom for connecting the main current circuits, electrical interlock included (NC contact interlock)		

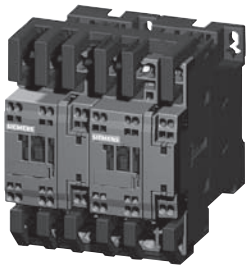
Fully wired and tested contactor assemblies · Size S0 · up to 25 HP



3RA23 24-8XE30-1BB4



3RA23 2.-8XB30-1A..



3RA23 2.-8XB30-2A..

AC data			UL data							Screw terminals	Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage U_s at 50/60 Hz	Auxiliary contacts		Spring-type terminals	
AC2/AC3	115 V	230 V	200 V	230 V	**460 V**	575 V		NO	NC	Order No.	
							V				kg
AC operation, 50/60 Hz											
Size S0[1]											
12	1	2	3	3	7 1/2	10	24 AC	2	2	**3RA23 24-8XB30-□AC2**	0.84/0.94
12	1	2	3	3	7 1/2	10	110/120 AC	2	2	**3RA23 24-8XB30-□AK6**	0.84/0.94
12	1	2	3	3	7 1/2	10	220/240 AC	2	2	**3RA23 24-8XB30-□AP6**	0.84/0.94
16	1	3	5	5	10	15	24 AC	2	2	**3RA23 25-8XB30-□AC2**	0.84/0.94
16	1	3	5	5	10	15	110/120 AC	2	2	**3RA23 25-8XB30-□AK6**	0.84/0.94
16	1	3	5	5	10	15	220/240 AC	2	2	**3RA23 25-8XB30-□AP6**	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	24 AC	2	2	**3RA23 26-8XB30-□AC2**	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	110/120 AC	2	2	**3RA23 26-8XB30-□AK6**	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	220/240 AC	2	2	**3RA23 26-8XB30-□AP6**	0.84/0.94
32	2	5	10	10	20	25	24 AC	2	2	**3RA23 27-8XB30-□AC2**	0.84/0.94
32	2	5	10	10	20	25	110/120 AC	2	2	**3RA23 27-8XB30-□AK6**	0.84/0.94
32	2	5	10	10	20	25	220/240 AC	2	2	**3RA23 27-8XB30-□AP6**	0.84/0.94
38	3	5	10	10	25	25	24 AC	2	2	**3RA23 28-8XB30-□AC2**	0.84/0.94
38	3	5	10	10	25	25	110/120 AC	2	2	**3RA23 28-8XB30-□AK6**	0.84/0.94
38	3	5	10	10	25	25	220/240 AC	2	2	**3RA23 28-8XB30-□AP6**	0.84/0.94
DC operation											
12	1	2	3	3	7 1/2	10	24 DC	2	2	**3RA23 24-8XB30-□BB4**	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	**3RA23 25-8XB30-□BB4**	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	**3RA23 26-8XB30-□BB4**	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	**3RA23 27-8XB30-□BB4**	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	**3RA23 28-8XB30-□BB4**	1.22/1.32
With communication interface[2]											
12	1	2	3	3	7 1/2	10	24 DC	2	2	**3RA23 24-8XE30-□BB4**	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	**3RA23 25-8XE30-□BB4**	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	**3RA23 26-8XE30-□BB4**	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	**3RA23 27-8XE30-□BB4**	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	**3RA23 28-8XE30-□BB4**	1.22/1.32

Screw terminals	**1**
Spring-loaded terminals	**2**

For other voltages see page 2/51.

For accessories and spare parts, see page 2/68-2/85.

1) For coil operating range, see page 2/51.

2) For use with 3RA27 and 3RA28 communication modules. See pages 2/26 to 2/33.

Selection and ordering data

For Reversing Contactors with communication interface: replace the 8XB30-1NB3 with 8XE30-1NB3.

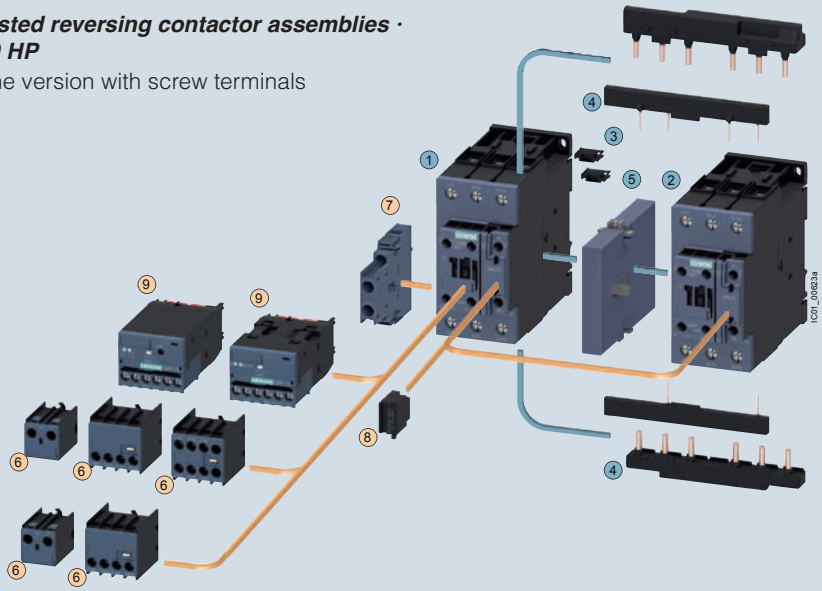
Size S2 · up to 50 HP

AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage [1]	Auxiliary contacts		Screw Terminals	Weight approx.
	115 V	230 V	200 V	230 V	**460 V**	575 V					
A	HP	HP	HP	HP	**HP**	HP		NO	NC	Order No.	kg
AC operation											
40	3	7.5	10	15	**30**	40	24 V, 50/60 Hz	2	2	**3RA2335-8XB30-1AC2**	1.72
							120 V, 60 Hz	2	2	**3RA2335-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2335-8XB30-1AP6**	
50	3	10	15	15	**40**	50	24 V, 50/60 Hz	2	2	**3RA2336-8XB30-1AC2**	1.72
							120 V, 60 Hz	2	2	**3RA2336-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2336-8XB30-1AP6**	
65	5	10	20	20	**50**	50	24 V, 50/60 Hz	2	2	**3RA2337-8XB30-1AC2**	2.548
							120 V, 60 Hz	2	2	**3RA2337-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2337-8XB30-1AP6**	
80 [1]	5	15	20	25	**50**	60	24 V, 50/60 Hz	2	2	**3RA2338-8XB30-1AC2**	2.548
							120 V, 60 Hz	2	2	**3RA2338-8XB30-1AK6**	
							240 V, 60 Hz	2	2	**3RA2338-8XB30-1AP6**	
AC/DC operation											
40	3	7.5	10	15	**30**	40	20-33 AC/DC	2	2	**3RA2335-8XB30-1NB3**	2.5
50	3	10	15	15	**40**	50	20-33 AC/DC	2	2	**3RA2336-8XB30-1NB3**	
65	5	10	20	20	**50**	50	20-33 AC/DC	2	2	**3RA2337-8XB30-1NB3**	
80 [1]	5	15	20	25	**50**	60	20-33 AC/DC	2	2	**3RA2338-8XB30-1NB3**	

1) Max UL FLA = 65A at 460V

Fully wired and tested reversing contactor assemblies · Size S2 · Up to 50 HP

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately		Type
6	Auxiliary switch block, front	3RH2911
7	Auxiliary switch block, lateral	3RH2921
8	Surge suppressors	3RT2936
9	Function module for connection to the control system	3RA271.-1BA00

For further voltages, see page 2/51.
For overview, see page 2/39-2/40.
For accessories, see page 2/68-2/85.
For circuit diagrams, see page 2/202.
For dimension drawings, see page 2/221.

Coil voltage tolerance:
at 50Hz: 0.8 to 1.1 x Us
at 60Hz: 0.85 to 1.1 x Us
at AC/DC: 0.8 to 1.1 x Us

Complete reversing contactor assembly

Individual parts		Type Q11	Q12
1 2	Contactors, 18.5 kW	3RT2035	3RT2035
1 2	Contactors, 22 kW	3RT2036	3RT2036
1 2	Contactors, 30 kW	3RT2037	3RT2037
1 2	Contactors, 37 kW	3RT2038	3RT2038
3 4	Assembly kit comprising:	3RA2933-2AA1	
	3 Two connectors for two contactors		
	4 Wiring modules on the top and bottom for connecting the main and auxiliary current circuits, electrical interlock included (NC contact interlock)		
5	Mechanical interlock (must be ordered separately)	3RA2934-2B	

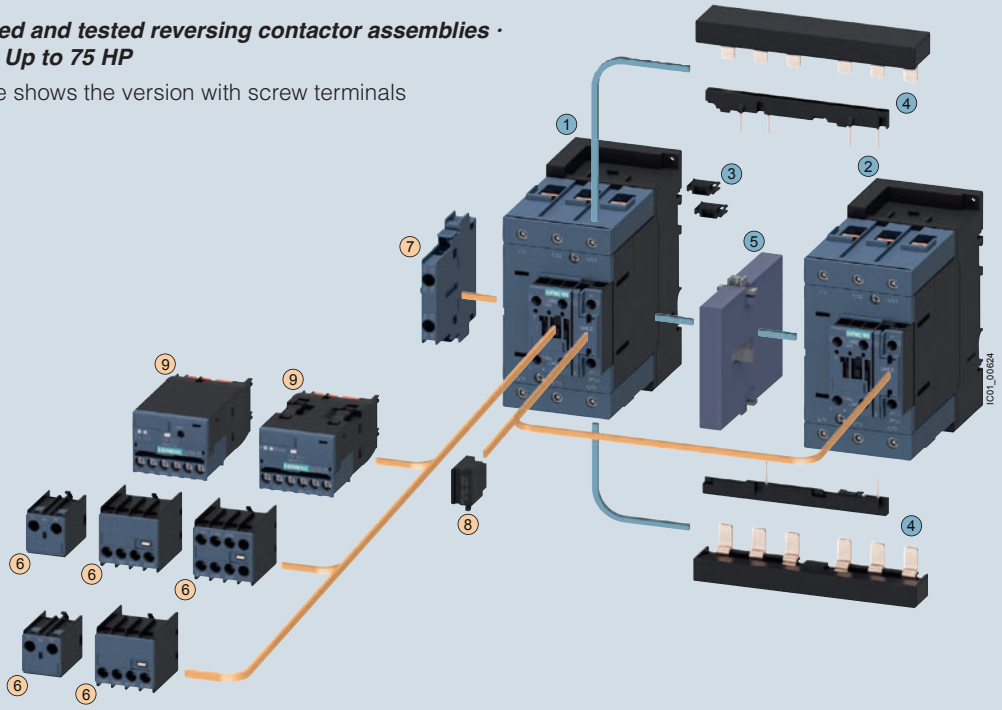
Selection and ordering data

Size S3 · up to 75 HP

AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage [1]	Auxiliary contacts		Fully wired and tested contactor assembly	Weight approx.
	115 V	230 V	200 V	230 V	**460 V**	575 V					
A	HP	HP	HP	HP	**HP**	HP		NO	NC	Order No.	kg
AC operation											
80	5	15	20	25	**50**	60	24 V, 50/60 Hz	0	2	**3RA2345-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2345-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2345-8XB30-1AP6**	
95	7.5	15	25	30	**60**	75	24 V, 50/60 Hz	0	2	**3RA2346-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2346-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2346-8XB30-1AP6**	
110	10	20	30	30	**75**	100	24 V, 50/60 Hz	0	2	**3RA2347-8XB30-1AC2**	3.9
							120 V, 60 Hz	0	2	**3RA2347-8XB30-1AK6**	
							240 V, 60 Hz	0	2	**3RA2347-8XB30-1AP6**	
AC/DC operation											
80	5	15	20	25	**50**	60	20-33 V AC/DC	0	2	**3RA2345-8XB30-1NB3**	5.7
95	7.5	15	25	30	**60**	75	20-33 V AC/DC	0	2	**3RA2346-8XB30-1NB3**	
110	10	20	30	30	**75**	100	20-33 V AC/DC	0	2	**3RA2347-8XB30-1NB3**	

Fully wired and tested reversing contactor assemblies · Size S3 · Up to 75 HP

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately	Type
(11) Auxiliary switch block, front	3RH2911
(12) Auxiliary switch block, lateral	3RH2921
(13) Surge suppressors	3RT2936
(14) Function module for connection to the control system (the associated module connectors 3RA2711-0EE17 must be ordered separately	3RA271.-1BA00

For further voltages, see page 2/51.
For overview, see page 2/39-2/40.
For accessories, see page 2/68-2/85.
For circuit diagrams, see page 2/202.
For dimension drawings, see page 2/221.

1) Coil voltage tolerance
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

Complete reversing contactor assembly

Individual parts	Type Q11	Q12
(1)(2) Contactors, 37 kW	3RT2045	3RT2045
(1)(2) Contactors, 45 kW	3RT2046	3RT2046
(1)(2) Contactors, 55 kW	3RT2047	3RT2047
(3)(4) Assembly kit comprising:	3RA2943-2AA1	
(3) Two connectors for two contactors		
(4) Wiring modules on the top and bottom for connecting the main and auxiliary current circuits, electrical interlock included (NC contact interlock)		
(5) Mechanical interlock (must be ordered separately)	3RA2934-2B	

Overview

These 3RA24 contactor assemblies for wye-delta starting are designed for standard applications.

Note:
Contactor assemblies for wye-delta starting in special applications such as very heavy starting or wye-delta starting of special motors must be customized. Help with designing such special applications is available from Technical Assistance.

The 3RA24 contactor assemblies for wye-delta starting can be ordered as follows:

Sizes S00 and S0

- Fully wired and tested, with electrical and mechanical interlock.
- As individual parts for customer assembly.

A dead interval of 50 ms on reversing is already integrated in the function module for wye-delta starting.

There is also a range of accessories (lateral auxiliary switch blocks, etc.) that must be ordered separately.

For overload relays for motor protection see Chapter 3 "Overload Relays" --> "3RB3 Solid-State Overload Relays".

The 3RA24 contactor assemblies have screw or spring-type terminals and are suitable for screwing or snapping onto TH 35 standard mounting rails.

With the fully wired and tested 3RA24 contactor assemblies, the auxiliary contacts included in the basic devices are unassigned.

Motor protection

Overload relays or thermistor motor protection releases can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

Surge suppression

Sizes S00 and S0

Surge suppression (varistor) is included in the function modules for wye-delta starting.

Function modules for wye-delta starting

The 3RA28 16-0EW20 wye-delta function module (see page 2/29 replaces the complete wiring in the control circuit and can be used in the voltage range from 24 to 240 V AC/DC. It is snapped onto the front of the contactor assembly size S00 or S0.

One function module comprises a complete module kit:

- One 3RA29 12-0 basic module with integrated control logic and time setting,
- And two 3RA29 11-0 coupling modules with related connecting cables.

The scope of supply comprises a complete module kit for one contactor assembly for wye-delta starting size S00 or S0, regardless of the connection method.

Screw terminals

Rated data at AC 50 Hz 400 V			Size			
Power	Operational current I_e	Motor current		Line/delta contactor	Star contactor	**Order No. complete**
kW	A	A				
5.5	12	9.5 ... 13.8	**S00-S00-S00**	3RT2015-1....	3RT2015-1....	**3RA2415-8XF32-1...**
7.5	16	12.1 ... 17		3RT2017-1....	3RT2015-1....	**3RA2416-8XF32-1...**
11	25	19 ... 25		3RT2018-1....	3RT2016-1....	**3RA2417-8XF32-1...**
11	25	19 ... 25	**S0-S0-S0**	3RT2024-1...0	3RT2024-1...0	**3RA2423-8XF32-1...**
15	32	24.1 ... 34		3RT2026-1...0	3RT2024-1...0	**3RA2425-8XF32-1...**
18.5	40	34.5 ... 40		3RT2026-1...0	3RT2024-1...0	**3RA2425-8XF32-1...**
22	50	31 ... 43		3RT2027-1...0	3RT2026-1...0	**3RA2426-8XF32-1...**
22/30	50	31 ... 43	**S2-S2-S0**	3RT2035-1...0	3RT2026-1...0	**3RA2434-8XF32-1...**
37	80	62.1 ...77.8		3RT2035-1...0	3RT2027-1...0	**3RA2435-8XF32-1...**
45	86	69 ... 86		3RT2036-1...0	3RT2028-1...0	**3RA2436-8XF32-1...**
55	115	77.6 ...108.6	**S2-S2-S2**	3RT2037-1...0	3RT2035-1...0	**3RA2444-8XF32-1...**
75	150	120.7 ... 150		3RT2045-1...0	3RT2036-1...0	**3RA2445-8XF32-1...**
90	160	86 ... 160		3RT2046-1...0	3RT2037-1...0	**3RA2446-8XF32-1...**

Spring-type terminals

Rated data at AC 50 Hz 400 V			Size			
Power	Operational current I_e	Motor current		Line/delta contactor	Star contactor	**Order No. complete**
kW	A	A				
5.5	12	9.5 ... 13.8	**S00-S00-S00**	3RT2015-2....	3RT2015-2....	**3RA24 15-8XF31-2...**
7.5	16	12.1 ... 17		3RT2017-2....	3RT2015-2....	**3RA24 16-8XF31-2...**
11	25	19 ... 25		3RT2018-2....	3RT2016-2....	**3RA24 17-8XF31-2...**
11	25	19 ... 25	**S0-S0-S0**	3RT2024-2....0	3RT2024-2....0	**3RA24 23-8XF32-2...**
15	32	24.1 ... 34		3RT2026-2....0	3RT2024-2....0	**3RA24 25-8XF32-2...**
18.5	40	34.5 ... 40		3RT2026-2....0	3RT2024-2....0	**3RA24 25-8XF32-2...**
25	50	31 ... 43		3RT2027-2....0	3RT2026-2....0	**3RA24 26-8XF32-2...**

Note:

The selection of contactor types refers to fused configurations.

Components for customer assembly

Assembly kits with wiring modules and mechanical connectors are available for contactor assemblies for wye-delta starting. Contactors, overload relays, function modules for wye-delta starting or wye-delta timing relays, auxiliary switches for electrical interlock – if required also feeder terminals and base plates – must be ordered separately.

The wiring kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and star contactors (bottom).

Control circuit

Features:
- Time setting range 0.5 to 60 s (3 selectable settings)
- Wide voltage range 24 to 240 V AC/DC
- Dead interval of 50 ms, non-adjustable.

Screw terminals

	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
Power	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB1[1]	3RT29 16-4BA31	5.5 ... 8	3RU21 16-1HB0	4 ... 16	3RB30 16-1TB0
7.5				7 ... 10	3RU21 16-1JB0		
11				11 ... 16	3RU21 16-4AB0		
11	3RA28 16-0EW20	3RA29 23-2BB1[2]	3RT29 26-4BA31	11 ... 16	3RU21 26-4AB0	6 ... 25	3RB30 26-1QB0
15				14 ... 20	3RU21 26-4BB0		
18.5				20 ... 25	3RU21 26-4DB0		
22				20 ... 25	3RU21 26-4DB0		

Spring-type terminals

	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
Power	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB2[1]	3RT29 16-4BA32	5.5 ... 8	3RU21 16-1HC0	4 ... 16	3RB30 16-1TE0
7.5				7 ... 10	3RU21 16-1JC0		
11				11 ... 16	3RU21 16-4AC0		
11	3RA28 16-0EW20	3RA29 23-2BB2[2]	3RT29 26-4BA32	11 ... 16	3RU21 26-4AC0	6 ... 25	3RB30 26-1QE0
15				14 ... 20	3RU21 26-4BC0		
18.5				20 ... 25	3RU21 26-4DC0		
22				20 ... 25	3RU21 26-4DC0		

[1] The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper and auxiliary circuit wiring.

[2] The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper.

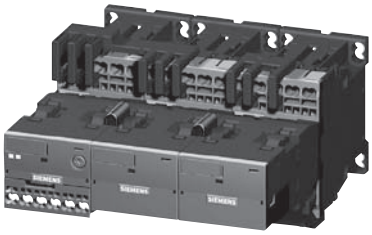
Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.	12.		13.	14.	15.	16.
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS contactor assemblies	**3 R A**															
2nd generation		**2**														
Device type (e. g. 4 = contactor assembly for wye-delta starting)			**4**													
Contactor size (1 = S00, 2 = S0)				□												
Power dependent on size (e. g. 25 = 15 kW)					□											
Type of overload relay (8X = without)							□	□								
Assembly (F = ready-assembled, E, H = ready-assembled with communication)									□							
Interlock (3 = mechanical and electrical)										□						
Free auxiliary switches (e. g. S00: 1 = 3 NO total, S0: 2 = 3 NO + 3 NC total)											□					
Connection type (1 = screw, 2 = spring)													□			
Operating range / solenoid coil circuit (e. g. A = AC standard / without)														□		
Rated control supply voltage (e. g. K6 = 110/120 V, 50/60 Hz)															□	□
Example	**3 R A**	**2**	**4**	**2**	**5**	**–**	**8**	**X**	**F**	**3**	**2**	**–**	**1**	**A**	**K**	**6**

3RA24 Contactor Assemblies for Wye-Delta Starting

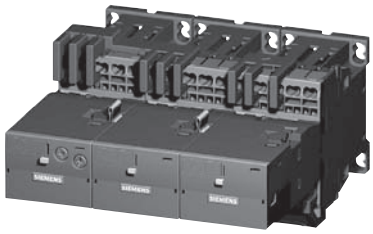
3RA24 complete units, 5.5 ... 22 kW

Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW



3RA24 1.-8XE31-2BB4

3RA24 1.-8XF31-1A.0



3RA24 1.-8XF31-2A.0

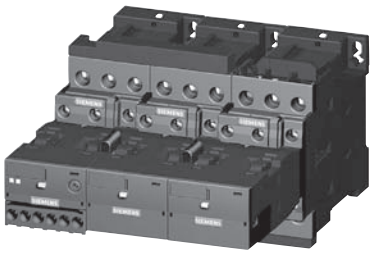
Rated data AC-3					Rated control supply voltage U_s [1] at 50/60 Hz	Screw terminals	Weight approx.	Spring-type terminals	Weight approx.
Operational current I_e up to	Ratings of induction motors at 50 Hz and					Order No.		Order No.	
400 V	230 V	**400 V**	500 V	690 V					
A	kW	**kW**	kW	kW	V		kg		kg
AC operation, 50/60 Hz									
12	3.3	**5.5**	7.2	9.2	24 AC	**3RA24 15-8XF31-1AB0**	0.910	**3RA24 15-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 15-8XF31-1AF0**	0.850	**3RA24 15-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 15-8XF31-1AP0**	0.850	**3RA24 15-8XF31-2AP0**	0.910
16	4.7	**7.5**	10.3	9.2	24 AC	**3RA24 16-8XF31-1AB0**	0.910	**3RA24 16-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 16-8XF31-1AF0**	0.850	**3RA24 16-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 16-8XF31-1AP0**	0.850	**3RA24 16-8XF31-2AP0**	0.910
25	5.5	**11**	11	11	24 AC	**3RA24 17-8XF31-1AB0**	0.850	**3RA24 17-8XF31-2AB0**	0.910
					110/120 AC	**3RA24 17-8XF31-1AF0**	0.850	**3RA24 17-8XF31-2AF0**	0.910
					220/240 AC	**3RA24 17-8XF31-1AP0**	0.850	**3RA24 17-8XF31-2AP0**	0.910
DC operation									
12	3.3	**5.5**	7.2	9.2	24 DC	**3RA24 15-8XF31-1BB4**	0.910	**3RA24 15-8XF31-2BB4**	0.910
16	4.7	**7.5**	10.3	9.2	24 DC	**3RA24 16-8XF31-1BB4**	0.910	**3RA24 16-8XF31-2BB4**	0.910
25	5.5	**11**	11	11	24 DC	**3RA24 17-8XF31-1BB4**	1.030	**3RA24 17-8XF31-2BB4**	1.090
For IO-Link connection									
12	3.3	**5.5**	7.2	9.2	24 DC	**3RA24 15-8XE31-1BB4**	1.030	**3RA24 15-8XE31-2BB4**	1.090
16	4.7	**7.5**	10.3	9.2	24 DC	**3RA24 16-8XE31-1BB4**	1.030	**3RA24 16-8XE31-2BB4**	1.090
25	5.5	**11**	11	11	24 DC	**3RA24 17-8XE31-1BB4**	1.030	**3RA24 17-8XE31-2BB4**	1.090
For AS-Interface connection									
12	3.3	**5.5**	7.2	9.2	24 DC	**3RA24 15-8XH31-1BB4**	1.050	**3RA24 15-8XH31-2BB4**	1.110
16	4.7	**7.5**	10.3	9.2	24 DC	**3RA24 16-8XH31-1BB4**	1.050	**3RA24 16-8XH31-2BB4**	1.110
25	5.5	**11**	11	11	24 DC	**3RA24 17-8XH31-1BB4**	1.050	**3RA24 17-8XH31-2BB4**	1.110

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

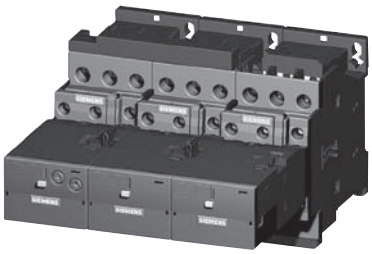
For other voltages see page 2/51.

[1] Coil operating range at 50 Hz: 0.8 ... 1.1 x U_s; at 60 Hz: 0.85 ... 1.1 x U_s.

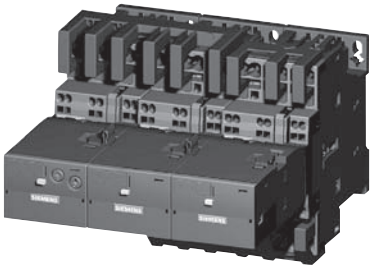
Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW



3RA24 2.-8XE32-1BB4



3RA24 2.-8XF32-1A.2



3RA24 2.-8XF32-2A.2

Rated data AC-3					Rated control supply voltage U_s [1] at 50/60 Hz	Screw terminals	Weight approx.	Spring-type terminals	Weight approx.
Operational current I_e up to	Ratings of induction motors at 50 Hz and					Order No.		Order No.	
400 V	230 V	**400 V**	500 V	690 V					
A	kW	**kW**	kW	kW	V		kg		kg
AC operation, 50/60 Hz									
25	7.1	**11**	15.6	19	24 AC	**3RA24 23-8XF32-1AC2**	1.370	**3RA24 23-8XF32-2AC2**	1.530
					110/220 AC	**3RA24 23-8XF32-1AK6**	1.370	**3RA24 23-8XF32-2AK6**	1.530
					220/240 AC	**3RA24 23-8XF32-1AP6**	1.370	**3RA24 23-8XF32-2AP6**	1.530
32 / 40	11.4	**15 / 18.5**	19	19	24 AC	**3RA24 25-8XF32-1AC2**	1.370	**3RA24 25-8XF32-2AC2**	1.530
					110/220 AC	**3RA24 25-8XF32-1AK6**	1.370	**3RA24 25-8XF32-2AK6**	1.530
					220/240 AC	**3RA24 25-8XF32-1AP6**	1.370	**3RA24 25-8XF32-2AP6**	1.530
50	--	**22**	19	19	24 AC	**3RA24 26-8XF32-1AC2**	1.390	**3RA24 26-8XF32-2AC2**	1.550
					110/220 AC	**3RA24 26-8XF32-1AK6**	1.390	**3RA24 26-8XF32-2AK6**	1.550
					220/240 AC	**3RA24 26-8XF32-1AP6**	1.390	**3RA24 26-8XF32-2AP6**	1.550
DC operation									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XF32-1BB4**	1.940	**3RA24 23-8XF32-2BB4**	2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XF32-1BB4**	1.940	**3RA24 25-8XF32-2BB4**	2.100
50	--	**22**	19	19	24 DC	**3RA24 26-8XF32-1BB4**	1.960	**3RA24 26-8XF32-2BB4**	2.120
For IO-Link connection									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XE32-1BB4**	1.940	**3RA24 23-8XE32-2BB4**	2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XE32-1BB4**	1.940	**3RA24 25-8XE32-2BB4**	2.100
50	--	**22**	19	19	24 DC	**3RA24 26-8XE32-1BB4**	1.960	**3RA24 26-8XE32-2BB4**	2.120
For AS-Interface connection									
25	7.1	**11**	15.6	19	24 DC	**3RA24 23-8XH32-1BB4**	1.960	**3RA24 23-8XH32-2BB4**	2.120
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	**3RA24 25-8XH32-1BB4**	1.960	**3RA24 25-8XH32-2BB4**	2.120
50	--	**22**	19	19	24 DC	**3RA24 26-8XH32-1BB4**	1.980	**3RA24 26-8XH32-2BB4**	2.140

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

For other voltages see page 2/51 .

[1] Coil operating range at 50 Hz: 0.8 ... 1.1 x U_s ; at 60 Hz: 0.85 ... 1.1 x U_s.

Selection and ordering data

Contactor type Rated control supply voltage U_S			3RT201 3RA211	3RT231 3RT251	3RT202 3RA212	3RT232 3RT252	3RT2617 3RT2627 3RT2637	3RT203 3RA213	3RT233 3RT253	3RT104 3RT134 3RT144 3RA114
			S00	*S00*	*S0*	*S0*	*S00-S2*	*S2*	*S2*	*S3*
Rated control supply voltages (changes to 10th and 11th positions of the Order No.)										
AC Operation [1]										
Coils for 50 Hz (exception: size S00: 50 and 60 Hz [2])	**24 V AC**		B0	B0	B0	B0	B0	B0	B0	B0
	42 V AC		D0	D0	D0	--	--	D0	--	D0
	48 V AC		H0	H0	H0	--	--	H0	--	H0
	110 V AC		F0	F0	F0	F0	F0	F0	F0	F0
	230 V AC		P0	P0	P0	P0	P0	P0	P0	P0
	400 V AC		V0	V0	V0	V0	V0	V0	V0	V0
Coils for 50 and 60 Hz [2]	**24 V AC**		B0	B0	C2	C2	C2	C2	C2	C2
	42 V AC		D0	D0	D2	D2	--	D2	D2	D2
	48 V AC		H0	H0	H2	H2	--	H2	H2	H2
	110 V AC		F0	F0	G2	G2	G2	G2	G2	G2
	208 V AC		M2	M2	M2	M2	M2	M2	M2	M2
	220 V AC		N2	N2	N2	N2	N2	N2	N2	N2
	230 V AC		P0	P0	L2	L2	L2	L2	L2	L2
	240 V AC		P2	P2	P2	P2	P2	P2	P2	P2
For USA and Canada [3]	50 Hz:	60 Hz:								
	110 V AC	**120 V AC**	K6	K6	K6	K6	K6	K6	K6	K6
	220 V AC	**240 V AC**	P6	P6	P6	P6	P6	P6	P6	P6
		277 V AC	—	—	—	U6	—	U6	U6	U6
		480 V AC	V6	—	V6	—	—	V6	V6	V6
		600 V AC	—	—	—	T6	—	T6	T6	T6
For Japan	50/60 Hz [4]:	60 Hz [5]:								
	100 V AC	**110 V AC**	G6	G6	G6	G6	G6	G6	G6	G6
	200 V AC	**220 V AC**	N6	N6	N6	N6	N6	N6	N6	N6
	400 V AC	**440 V AC**	R6	R6	R6	R6	R6	R6	R6	R6
DC Operation [1]										
	12 V DC		A4	A4	—	—	—	—	—	—
	24 V DC		B4	B4	B4	B4	—	—	—	—
	42 V DC		D4	D4	D4	D4	—	—	—	—
	48 V DC		W4	W4	W4	W4	—	—	—	—
	60 V DC		E4	E4	E4	E4	—	—	—	—
	72 V DC		J8	J8	J8	J8	—	—	—	—
	80 V DC		—	—	—	—	—	—	—	—
	110 V DC		F4	F4	F4	F4	—	—	—	—
	125 V DC		G4	G4	G4	G4	—	—	—	—
	220 V DC		M4	M4	M4	M4	—	—	—	—
	230 V DC		P4	P4	P4	—	—	—	—	—

Coil codes for frame sizes S6-S12 can be found on page 2/9. Further voltages on request

Rated control supply voltage $U_{s\,min}$ ... $U_{s\,max}$ [6]	**Contactor type** **Size**	**--** **S00**	**3RT2. 2.-.N** **S0**	Rated control supply voltage $U_{s\,min}$ ... $U_{s\,max}$ [6]	**Contactor type** **Size**	**3RT2. 3.-.N** **S2**	**3RT2. 2.-.N** **S3**
Sizes S00 to S3							
AC/DC operation (50/60 Hz AC, DC)							
21 ... 28 V AC/DC		--	B3	20 ... 33 V AC/DC		B3	B3
95 ... 130 V AC/DC		--	F3	83 ... 155 V AC/DC		F3	F3
200 ... 280 V AC/DC [7]		--	P3	175 ... 280 V AC/DC		P3	P3

[1] For deviating coil voltages and coil operating ranges of sizes S00 and S0, the SITOP power 24 V DC power supply unit with wide range input (93 to 264 V AC; 30 to 264 V DC) can be used for coil excitation (For more SITOP information see section 15).

[2] Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_S
at 60 Hz: 0.85 ... 1.1 x U_S

[3] Coil operating range
Size S00: at 50 Hz: 0.85.... 1.1 x U_S
at 60 Hz: 0.8 ... 1.1 x U_S
Size S0 to S3: at 50 Hz and 60 Hz: 0.8 ... 1.1 x U_S

[4] Coil operating range
Size S00: at 50/60 Hz: 0.85 ... 1.1 x U_S
Size S0: at 50 Hz: 0.8 ... 1.1 x U_S
at 60 Hz: 0.85 ... 1.1 x U_S

[5] Coil operating range
at 60 Hz: 0.8 ...1.1 x U_S

[6] Coil operating range for S0: 0.7 x $U_{s\,min}$ ... 1.3 x $U_{s\,max}$
Coil operating range for S2: 0.8 x $U_{s\,min}$ ...1.1 x $U_{s\,max}$

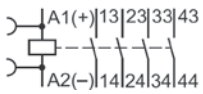
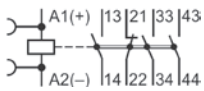
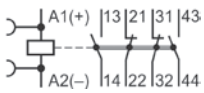
[7] The following applies to S0 and $U_{s\,max}$ = 280 V: Upper limit =1.1 x $U_{s\,max}$

Selection and ordering data
AC and DC operation

3RH11 . . -1 . . . .

3RH11 . . -2 . . . .

Size S00 – Terminal designations according to EN 50011

Rated current at **240 V** NEMA A600/Q600	Auxiliary contacts Ident-ification No.	Version NO	Version NC	Rated control supply voltage U_S	**AC Operation Screw Terminals**[1) 2)]	Rated control supply voltage U_S	**DC Operation Screw Terminals**[1) 2)]
Amps				V AC 50/60 Hz[3)]	**Order No.**	V DC	**Order No.**
For screw and snap-on mounting onto TH 35 standard mounting rail							
 10	40E	4	—	24 110/120 220/240	**3RH2140-1AB00** **3RH2140-1AK60** **3RH2140-1AP60**	24 110 220	**3RH2140-1BB40** **3RH2140-1BF40** **3RH2140-1BM40**
 10	31E	3	1	24 110/120 220/240	**3RH2131-1AB00** **3RH2131-1AK60** **3RH2131-1AP60**	24 110 220	**3RH2131-1BB40** **3RH2131-1BF40** **3RH2131-1BM40**
 10	22E	2	2	24 110/120 220/240	**3RH2122-1AB00** **3RH2122-1AK60** **3RH2122-1AP60**	24 110 220	**3RH2122-1BB40** **3RH2122-1BF40** **3RH2122-1BM40**

Notes:
For further voltages, see page 2/51.
For accessories, see pages 2/68-2/79.
For technical data, see pages 2/187-2/190.
For overview, see page 2/118.
For position terminals, see page 2/204-2/205.
For dimension drawings, see page 2/126.

1) The 3RH21 contactor relays are also available with spring-type terminals. Replace the 8th digit of the order number with a "2" e.g. "3RH2140-2AB00"

2) The 3RH21 contactor relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4" e.g. "3RH2140-4AB00"

3) AC coil operating range at 50 Hz: 0.8 to 1.1 x U_S at 60 Hz: 0.85 to 1.1 x U_S

4) For AC-15/AC-14 the following applies: I_e = 6A for mounted auxiliary contacts.

Overview

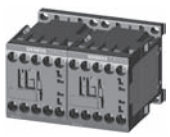
The contactor coil and the coil of the release solenoid are both designed for uninterrupted duty.

The number of auxiliary contacts can be extended by means of front auxiliary switch blocks (up to 4 poles).

RC elements, varistors diodes or diode assemblies can be fitted to both coils from the front for damping opening surges in the coil.

Selection and ordering data

Size S00 – Terminal designations according to EN 5001

Rated current at **240 V** AC-14, AC-15 **NEMA A600/Q600**	Aux. contacts Ident. No.	Aux. contacts Version NO	Aux. contacts Version NC	Rated control supply voltage U_S	**AC Operation Screw Terminals**[1] **Order No.**	Rated control supply voltage U_S	**DC Operation Screw Terminals Order No.**
Amps				V AC		V DC	
For screw and snap-on mounting onto TH 35 standard mounting rail							
 3RH2422-1BB40							
10	40E	4	—	24, 50/60 Hz 110, 50 Hz/120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	**3RH2440-1AB00** **3RH2440-1AK60** **3RH2440-1AP60** **3RH2440-1AP00**	24 110 125 220	**3RH2440-1BB40** **3RH2440-1BF40** **3RH2440-1BG40** **3RH2440-1BM40**
10	31E	3	1	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	**3RH2431-1AB00** **3RH2431-1AK60** **3RH2431-1AP60** **3RH2431-1AP00**	24 110 125 220	**3RH2431-1BB40** **3RH2431-1BF40** **3RH2431-1BG40** **3RH2431-1BM40**
10	22E	2	2	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	**3RH2422-1AB00** **3RH2422-1AK60** **3RH2422-1AP60** **3RH2422-1AP00**	24 110 125 220	**3RH2422-1BB40** **3RH2422-1BF40** **3RH2422-1BG40** **3RH2422-1BM40**

For accessories for 3RH24, see below and page 2/68-2/79
For technical data, see page 2/187-2/190.
For overview, see page 2/118.
For position of terminals, see page 2/204-2/205.
For dimension drawings, see page 2/227.

Auxiliary switch blocks for 3RH21, 3RH24 control relays

Size S00 – For assembling to control relays to have 8 contacts

For contactor type	For contactor HS Block Ident. No.	Contacts Version NO	Contacts Version NC	Weight approx. kg.	**Screw Terminals Order No.**	**Spring Terminals Order No.**
Auxiliary switch blocks for snapping onto the front according to EN 50011						
 3RH2911-1GA40						
3RH2140, 3RH2440, Ident. No. 40 E	80E	4	—	0.050	**3RH2911-1GA40**	**3RH2911-2GA40**
3RH2140, 3RH2440, Ident. No. 40 E	71E	3	1	0.050	**3RH2911-1GA31**	**3RH2911-2GA31**
3RH2140, 3RH2440, Ident. No. 40 E	62E	2	2	0.050	**3RH2911-1GA22**	**3RH2911-2GA22**
3RH2140, 3RH2440, Ident. No. 40 E	53E	1	3	0.050	**3RH2911-1GA13**	**3RH2911-2GA13**
 3RH2911-2GA40						
3RH2140, 3RH2440, Ident. No. 40 E	44E	—	4	0.050	**3RH2911-1GA04**	**3RH2911-2GA04**

1) Coil voltage tolerance
at 50 Hz: 0.8 to 1.1 x U_S
at 60 Hz: 0.85 to 1.1 x U_S

For further accessories see pages 2/68-2/79

Application

DC operation
IEC 60 947 and EN 60 947

The 3RH21 coupling relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

The 3RH21 coupling relays cannot be extended with auxiliary switch blocks.

Coupling relays have a low power consumption, an extended coil voltage tolerance and an integrated surge suppressor for damping opening surges on select versions

Selection and ordering data

DC operation

Size S00 – Terminal designations according to EN 50 011

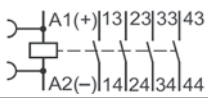
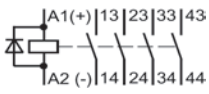
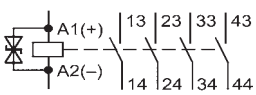
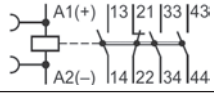
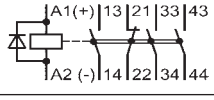
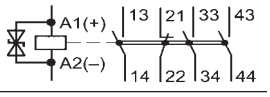
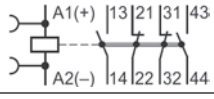
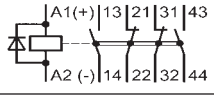
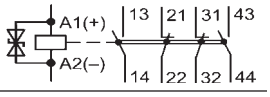
	Surge suppressor	Rated current at **240 V** NEMA A600/Q600	Auxiliary contacts Ident-ification No.	Version NO	Version NC	**Screw Terminals**[1] **Order No.**	**Spring Terminals**[1] **Order No.**	Weight approx. kg.
		Amps						
For screw and snap-on mounting onto TH 35 standard mounting rail								
Rated control supply voltage U_s = 24 V DC, coil voltage tolerance **0.7 to 1.25 x U_s** Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)	Diode, varistor, or RC element can be mounted	10	**40E**	4	—	**3RH2140-1HB40**	**3RH2140-2HB40**	0.300
		10	**31E**	3	1	**3RH2131-1HB40**	**3RH2131-2HB40**	0.300
		10	**22E**	2	2	**3RH2122-1HB40**	**3RH2122-2HB40**	0.300
	Diode integrated	10	**40E**	4	—	**3RH2140-1JB40**	**3RH2140-2JB40**	0.300
		10	**31E**	3	1	**3RH2131-1JB40**	**3RH2131-2JB40**	0.300
		10	**22E**	2	2	**3RH2122-1JB40**	**3RH2122-2JB40**	0.300
	Suppressor diode integrated	10	**40E**	4	—	**3RH2140-1KB40**	**3RH2140-2KB40**	0.300
		10	**31E**	3	1	**3RH2131-1KB40**	**3RH2131-2KB40**	0.300
		10	**22E**	2	2	**3RH2122-1KB40**	**3RH2122-2KB40**	0.300
Rated control supply voltage U_s = 24 V DC, coil voltage tolerance **0.85 to 1.85 x U_s** Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)	Diode, varistor, or RC element can be mounted	10	**40E**	4	—	**3RH2140-1MB40-0KT0**	**3RH2140-2MB40-0KT0**	0.300
		10	**31E**	3	1	**3RH2131-1MB40-0KT0**	**3RH2131-2MB40-0KT0**	0.300
		10	**22E**	2	2	**3RH2122-1MB40-0KT0**	**3RH2122-2MB40-0KT0**	0.300
	Diode integrated	10	**40E**	4	—	**3RH2140-1VB40**	**3RH2140-2VB40**	0.300
		10	**31E**	3	1	**3RH2131-1VB40**	**3RH2131-2VB40**	0.300
		10	**22E**	2	2	**3RH2122-1VB40**	**3RH2122-2VB40**	0.300
	Suppressor diode integrated	10	**40E**	4	—	**3RH2140-1SB40**	**3RH2140-2SB40**	0.300
		10	**31E**	3	1	**3RH2131-1SB40**	**3RH2131-2SB40**	0.300
		10	**22E**	2	2	**3RH2122-1SB40**	**3RH2122-2SB40**	0.300


3RH2140-1HB40


3RH2140-2SB40

For technical data, see 2/191.
For position of terminals, see 2/204-2/205.
For dimension drawings, see 2/227.

1) Ring lug terminals are also available. Replace the 8th digit of the order number with a "4", e.g. 3RH2140-4HB40

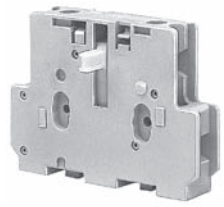
	Suppressor element mountable	Diode integrated	Suppressor diode integrated
40E			
31E			
22E			

Selection and ordering data

Maximum inductive current AC-3	Maximum power ratings UL Ratings 200 V	230 V	460 V	575 V	IEC ratings 1000 V	Max. resistive current AC-1	Auxiliary contacts NO	NC	Rated control supply voltage [1]	Order No.	Weight approx.
A	HP	HP	**HP**	HP	**kW**	A			V		kg
AC operation [2] [3]											
3TF68 	**Size 14** **Auxiliary and control conductors: screw terminals** **Main conductor: bar connections** **• AC Operation**										
630	200	250	**500**	600	600	700	4	4	110-132, 50/60 Hz	**3TF6844-■CF7**	15
630	200	250	**500**	600	600	700	4	4	200-240, 50/60 Hz	**3TF6844-■CM7**	15
820	290	350	**700**	860	800	910	4	4	110-132, 50/60 Hz	**3TF6944-■CF7**	19
820	290	350	**700**	860	800	910	4	4	200-240, 50/60 Hz	**3TF6944-■CM7**	19
							UL ratings shown in above table:			**■=0**	
							For IEC use only up to 1000 V:			**■=8**	
• DC Operation											
630	200	250	**500**	600	600	700	3	3	24 V DC	**3TF6833-■DB4**	16.9
820	290	350	**700**	860	800	910	3	3	24 V DC	**3TF6933-■DB4**	20.9
							UL ratings shown in above table:			**■=1**	
							For IEC use only up to 1000 V:			**■=8**	

Accessories and Spare parts for 3TF68 and 3TF69 vacuum contactors

Selection and ordering data

Details	For contactor type	Order No.	Weight approx.
			kg
Coils			
3TY7 	**AC Operation** The coils are fitted with varistors for damping surges as standard; the coil is supplied with the closing electronics included.	3TF68 3TF69	**3TY7683-0C●●** **3TY7693-0C●●**	0.65
	DC Operation Reversing contactors are required for size 14 contactors: Contactor type — Reversing contactor type 3TF68 and 3TF69: 3TC44 (70 mm wide, 85 mm high) The coils are supplied without a reversing contactor.	3TF68 3TF69	**3TY7683-0D●●** **3TY7693-0D●●**	0.56
	●● For rated control supply voltages, see page 2/104.			
Vacuum interrupters				
	In order to ensure reliable operation of the contactors, only Siemens original replacement interrupters should be used. 3 vacuum interrupters with mouning parts per set.	3TF68 3TF69	**3TY7680-0B** **3TY7690-0B**	3.2 3.5
Auxiliary switch blocks with screw terminals				
3TY7561-1. 	1 NO and 1 NC — First auxiliary switch block, left or right. Replacement type for: 3TY7561-1A, -1B	3TF68 / 3TF69	**3TY7561-1AA00**	0.042
	1 NO and 1 NC — First auxiliary switch block, left or right late break	3TF68 / 3TF69	**3TY7561-1EA00**	0.042
	1 NO and 1 NC — Second auxiliary switch block, left or right. Replacement type for: 3TY7 561-1K, -1L	3TF68 / 3TF69	**3TY7561-1KA00**	0.042
	Auxiliary switches for coil reconnection, for DC economy circuit with screw connections			
	1 NC — Auxiliary switch block late break	3TF68 / 3TF69	**3TY7681-1G**	0.042
	Solid-state compatible auxiliary switch block with screw terminals For mounting onto the side of contactors. For use in dusty atmosphere and electronic circuits with rated operational currents I_e AC-14 and DC-13 from 1 mA to 300 mA at 3 V to 60 V.	3TF68 / 3TF69	**3TY7561-1UA00**	0.042

For accessories, see page 2/55-2/56.
For technical data, see page 2/174-2/179.
For description, see page 2/119.
For internal circuit diagrams, see page 2/213.
For position of terminals, see page 2/210
For dimension drawings, see page 2/224.

1) For further voltages, see page 2/104.
2) Surge suppression integrated: fitted with varistor.
3) For EMC, see description on page 2/119.
3TF68/69 vacuum contactors are supplied with integrated surge suppression for the main conducting paths (for description, see page 2/119). In operation in circuits with DC choppers, frequency converters, variable-speed drives, for example, this protective circuitry is not required. It might be damaged by voltage peaks and harmonics generated, possibly followed by phase-to-phase shortcircuits. For this reason. the contactors can be supplied without overvoltage damping. To order these versions add a "-Z" and the order code "A02".

Selection and ordering data

	For contactor Size	Type	Design	Order No.	Weight approx. kg	Std. Pack Qty
Interface for control by PLC						
3TX7 090-0D 			Coil voltage tolerance: DC 17 V to 30 V Power consumption: 0.5 W at DC 24 V Fitted with varistor For technical data, see Part 7.			
	14	3TF68 and 3TF69	For snapping onto the side of auxiliary switch blocks, with surge suppression	**3TX7 090-0D**	0.1	1
Terminal covers						
3TX7 686-0A 				(Order No. and price per set)		
	14	3TF68	for protection against inadvertent contact with the exposed busbar connections (DIN VDE 0106 Part 100)"	**3TX7 686-0A**	0.17	1 set = 2 units
		3TF69		**3TX7 696-0A**		
Link for paralleling (star jumper) · 3-pole, without terminal [1]						
3TX7 680-0D 	**14**	3TF68		**3TX7 680-0D**	0.26	1
	• Cover plate for paralleling link					
	14	3TF68	A cover plate must be used in order to protect against inadvertent contact (DIN VDE 0106 Part 100).	**3TX7 680-0E**	0.18	1
Box terminals for laminated copper bars						
3TX7570-1E 	**• Without auxiliary conductor terminal**					
	14	3TF68	With single covers for protection against inadvertent contact (EN 50274)	**3TX7 570-1E**	0.6	1
	• With auxiliary conductor terminal					
	14	3TF69	Conductor cross-sections for auxiliary conductors: Solid: 2 × (0.75 ... 2.5) mm² Finely stranded with end sleeve: 2 × (0.5 ... 2.5) mm² Solid or stranded: 2 × (18 ... 12) AWG Tightening torque: 0.8 Nm ... 1.4 Nm (7 ... 12 lb.in)	**3TX7 690-1F**	2.0	1
Surge suppressors — Varistors						
3TX7 572-3G 	**14**	3TF68 and 3TF69	For DC economy circuit; for lateral snapping onto auxiliary switches *Rated control supply voltage, V DC* 24 … 48 48 … 127 127 … 240 The varistor is included in the scope of supply of the 3TF68 and 3TF69 contactors with AC operation. Includes the peak value of the alternating voltage on the DC side.	**3TX7 572-3G** **3TX7 572-3H** **3TX7 572-3J**	0.09 0.09 0.09	1 1 1

1) The link for paralleling can be reduced by one pole.

Ordering information

- Select Contactor from table below.
- Complete catalog number replace the two daggers (††) with appropriate coil voltage suffix. See corresponding coil voltage suffix table below.
- Technical Data see page 2/180-2/183.
- Dimensions see page 2/224.


3TC44


3TC52

	Frame Size	Ampere Rating Open	Ampere Rating Enclosed	2 Pole DC HP Ratings (DC-3, DC-5) 115 V	230 V	500 V	575 V	Auxiliary contacts NO	NC	AC-Operated Order No.	DC-Operated Order No.
3TC DC Contactors											
	2	40	40	5	10	15	15	2	2	**3TC4417–0B††**	**3TC4417–0A††**
	4	75	68	8	18	40	45	2	2	**3TC4817–0B††**	**3TC4817–0A††**
	8	220	200	25	50	100	100	2	2	**3TC5217–0B††**	**3TC5217–0A††**
	12	330	300	40	75	150	150	2	2	**3TC5617–0B††**	**3TC5617–0A††**

	Device	Frame Size	Catalog Number					
Coils, AC			**24V AC**	**120V AC**	**220/240V AC**	**277V AC**	**480V AC**	**600V AC**
 3TY6483-0AK6	3TC	3TC4417-0B††	**3TY7403-0AC2**	**3TY7403-0AK6**	**3TY7403-0AP6**	**3TY7403-0AU1**	**3TY7403-0AV0**	**3TY7403-0AS0**
		3TC4817-0B††	**3TY6483-0AC1**	**3TY6483-0AK6**	**3TY6483-0AP6**	**3TY6483-0AP0**	**3TY6483-0AV0**	**3TY6483-0AS0**
		3TC5217-0B††		**3TY6523-0AK6**	**3TY6523-0AP6**	**3TY6523-0AP0**	**3TY6523-0AV0**	
		3TC5617-0B††		**3TY6566-0AK6**		**3TY6566-0AP0**	**3TY6566-0AV0**	**3TY6566-0AS0**
Coils, DC			**24V DC**	**48V DC**	**110V DC**	**125V DC**	**230V DC**	
 3TY6483-0BB4	3TC	3TC4417-0A††	**3TY6443-0BB4**		**3TY6443-0BF4**	**3TY6443-0BG4**		
		3TC4817-0A††	**3TY6483-0BB4**	**3TY6483-0BW4**	**3TY6483-0BF4**	**3TY6483-0BG4**		
		3TC5217-0A††	**3TY6523-0BB4**		**3TY6523-0BF4**	**3TY6523-0BG4**	**3TY6523-0BP4**	
		3TC5217-0A††	**3TY6563-0BB4**		**3TY6563-0BF4**	**3TY6563-0BG4**	**3TY6563-0BP4**	

	Frame size	Contactor type	Mounting position	Solid state	Order No.
Auxiliary Contact Blocks with 1 NO + 1 NC contacts [2]					
 3TY6501-1A	2, 4	3TC44 or 3TC48	1st block, left or right	—	**3TY6501-1AA00**
			2nd block, left or right	Yes[3]	**3TY7561-1UA00**
	4	3TC48	2nd block, left [5]	—	**3TY6501-1K**
			2nd block, right[5]	—	**3TY6501-1L**
	8, 12	3TC52 or 3TC56	1st block, left	—	**3TY6561-1A**
			1st block, right	—	**3TY6561-1B**
			2nd block, left[5]	—	**3TY6561-1K**
			2nd block, right[5]	—	**3TY6561-1L**

	Device Type	Frame Size	Catalog Number
Main Contacts [1]			
 3TY2480-0A	3TC	3TC44	**3TY2440-0A**
		3TC48	**3TY2480-0A**
		3TC52	**3TY2520-0A**
		3TC56	**3TY2560-0A**
Arc Chutes			
 3TY2482-0A	3TC	3TC44	**3TY2442-0A**
		3TC48	**3TY2482-0A**
		3TC52	**3TY2522-0A**
		3TC56	**3TY2562-0A**

Coil Suffix Table ††

Replace †† in the contactor Order No. with a coil code from the table below.

V AC 50/60 Hz	Code
24	C1
120	K1*
240	P1
460	V0
600	S0

*Use suffix K2 for 3TC44.

V DC	Code
24	B4
36	V4
48	W4
60	E4
72	J8
110	F4
125	G4
220	M4
230	P4

1) Main contact kits for size 3TC48 and larger include springs. Smaller sizes do not.

2) On DC operated contactors the maximum number of auxiliary contacts is 2 NO, 2 NC.

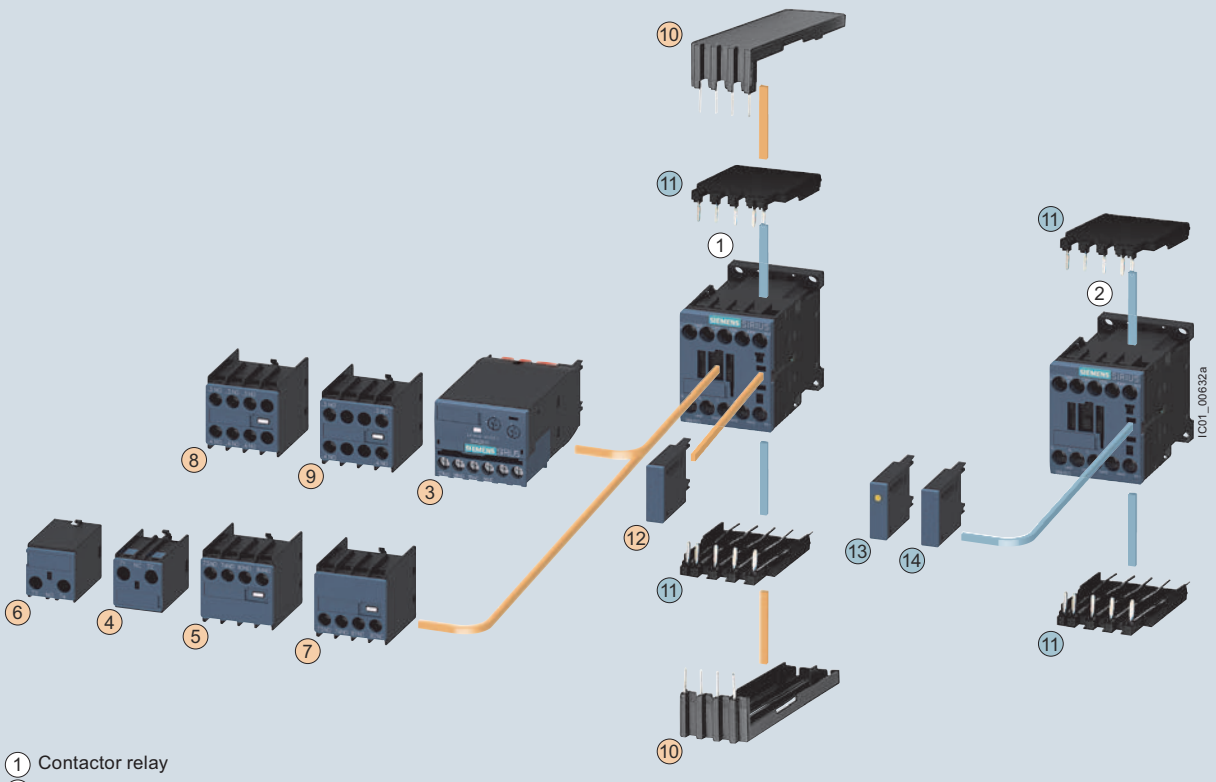
3) For use in dusty atmosphere and electronic circuits with rated operational currents I_e AC-14 and DC-13 from 1 mA to 300 mA at 3V to 60V. With 1 changeover contact.

4) Discount Code: DC Contactors

5) Can only be mounted on AC-operated contactors.

	For contactors		Version	Rated control supply voltage U_s		Order No.	Std. Pack Qty
	Size	Type		V AC	V DC		
Surge suppressors · Varistors							
 3TX7 402-3.	**2**	3TC44[1]	**Varistors**[2] with line spacer, for mounting onto the coil terminal	24 ... 48	24 ... 70	**3TX7 402-3G**	1
				48 ... 127	70 ... 150	**3TX7 402-3H**	1
				127 ... 240	150 ... 250	**3TX7 402-3J**	1
				240 ... 400		**3TX7 402-3K**	1
				400 ... 600		**3TX7 402-3L**	1
 3TX7 462-3.	**4**	3TC48	**Varistors**[2] for sticking onto the contactor base or for mounting separately	24 ... 48	24 ... 70	**3TX7 462-3G**	1
				48 ... 127	70 ... 150	**3TX7 462-3H**	1
				127 ... 240	150 ... 250	**3TX7 462-3J**	1
				240 ... 400		**3TX7 462-3K**	1
				400 ... 600		**3TX7 462-3L**	1
	8 and 12	3TC52, 3TC56	**Varistor** for sticking onto the contactor base or for mounting separately	24 ... 48		**3TX7 462-3G**	1
				48 ... 127		**3TX7 462-3H**	1
				127 ... 240		**3TX7 462-3J**	1
				240 ... 400		**3TX7 462-3K**	1
				400 ... 600		**3TX7 462-3L**	1
 3TX7 522-3.	**8 and 12**	3TC52, 3TC56	**Varistors**[2] for separate screw connection or snapping onto TH 35 standard mounting rail		24 ... 70	**3TX7 522-3G**	1
					70 ... 150	**3TX7 522-3H**	1
					150 ... 250	**3TX7 522-3J**	1
Surge suppressors · RC elements							
 3TX7 462-3., 3TX7 522-3.	**4**	3TC48	**RC elements** For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48	24 ... 70	**3TX7 462-3R**	
						3TX7 522-3R	
				48 ... 127	70 ... 150	**3TX7 462-3S**	
						3TX7 522-3S	
				127 ... 240	150 ... 250	**3TX7 462-3T**	
						3TX7 522-3T	
				240 ... 400		**3TX7 462-3U**	
				400 ... 600		**3TX7 462-3V**	
	8 and 12	3TC52, 3TC56	**RC elements** For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48		**3TX7 522-3R**	
				48 ... 127		**3TX7 522-3S**	
				127 ... 240		**3TX7 522-3T**	
				240 ... 400		**3TX7 522-3U**	
				400 ... 600		**3TX7 522-3V**	
Surge suppressors · Diodes							
 3TX7 462-3.	**4 to 12**	3TC48, 3TC52, . 3TC56	**Diode assemblies**[3] (diode and Zener diode) for DC solenoid system, for sticking onto the contactor base or for mounting separately		24 ... 250	**3TX7 462-3D**	
Terminal covers							
 3TX6 506-3B	**6**	3TC48	For protection against inadvertent contact with exposed busbar connections. Can be screwed on free screw end. Covers one busbar connection			**3TX6 506-3B**	1 set= 6 units
	10 and 14	3TC52, 3TC56				**3TX6 546-3B**	1 set= 6 units

[1] The connection piece for mounting the surge suppressor must be bent slightly.
[2] Includes the peak value of the alternating voltage on the DC side.
[3] Not for DC economy circuit.



1 Contactor relay
2 Coupling contactor relay for auxiliary circuits

3 3RA28 function module
4 1-pole auxiliary switch block, cable entry from the top
5 2-pole auxiliary switch block, cable entry from the top
6 1-pole auxiliary switch block, cable entry from the bottom
7 2-pole auxiliary switch block, cable entry from the bottom
8 4-pole auxiliary switch block
(terminal designations according to EN 50011 or EN 50005)
9 2-pole auxiliary switch block, solid-state compatible version
(terminal designations according to EN 50005)

10 Solder pin adapter for contactor relays with 4-pole auxiliary switch block
11 Solder pin adapter
12 Additional load module for increasing the permissible residual current
13 Surge suppressor with LED
14 Surge suppressor without LED

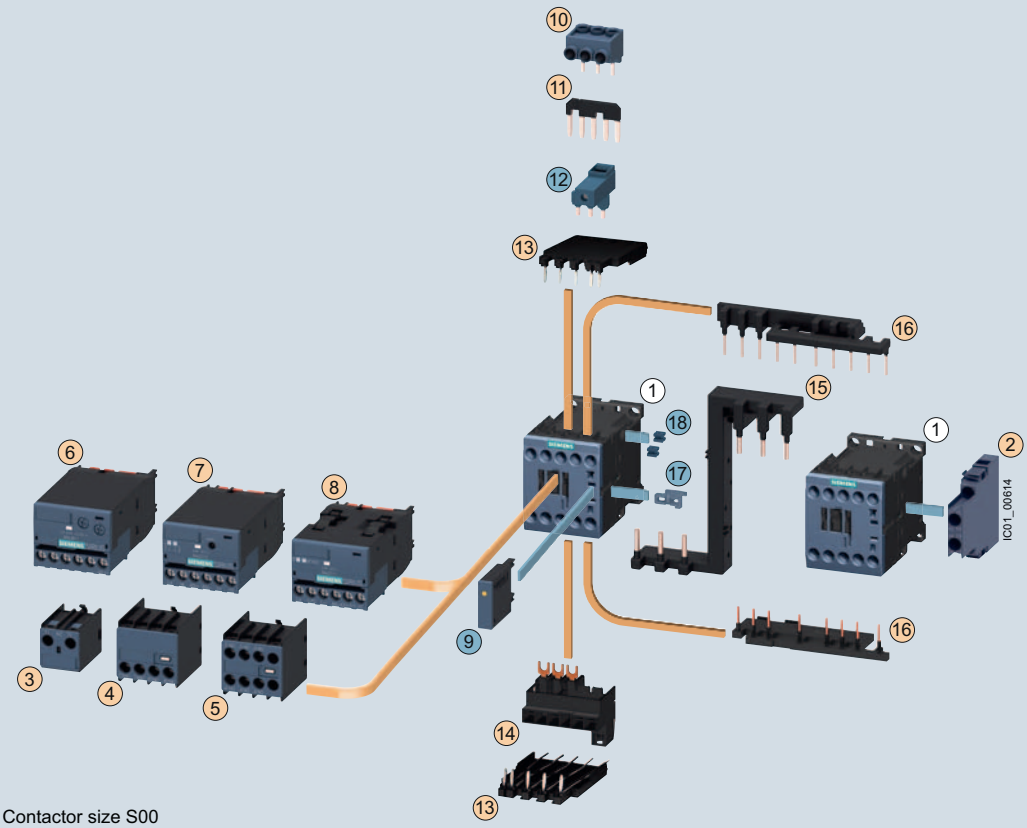
For contactor relays
For increasing the permissible residual current

Overview

The SIRIUS family of controls

The SIRIUS modular system with its components for the switching, starting, protection and monitoring of motors and industrial systems stands for the fast, flexible and space-saving construction of control cabinets.

3RT2 contactors
Size S00 with mountable accessories



(1) Contactor size S00

(2) 2-pole auxiliary switch block, laterally mountable
(3) 1-pole auxiliary switch block, for snapping onto the front cable entry from the top
(4) 2-pole auxiliary switch block, for snapping onto the front cable entry from the bottom
(5) 4-pole auxiliary switch block, for snapping onto the front
(6) 3RA28 function module
(7) 3RA27 function module for AS-Interface, direct starting
(8) 3RA27 function module for IO-Link, direct starting
(9) Surge suppressor with/without LED
(10) Three-phase feeder terminal

(11) Star jumper, 3-pole, without connecting terminal
(12) Link for paralleling, 3-pole, with connecting terminal
(13) Solder pin adapter
(14) Connection module (adapter and connector) for contactors with screw-type connection
(15) Safety main current connector for two contactors

Assembly kit 3RA2913-2AA1 comprising:

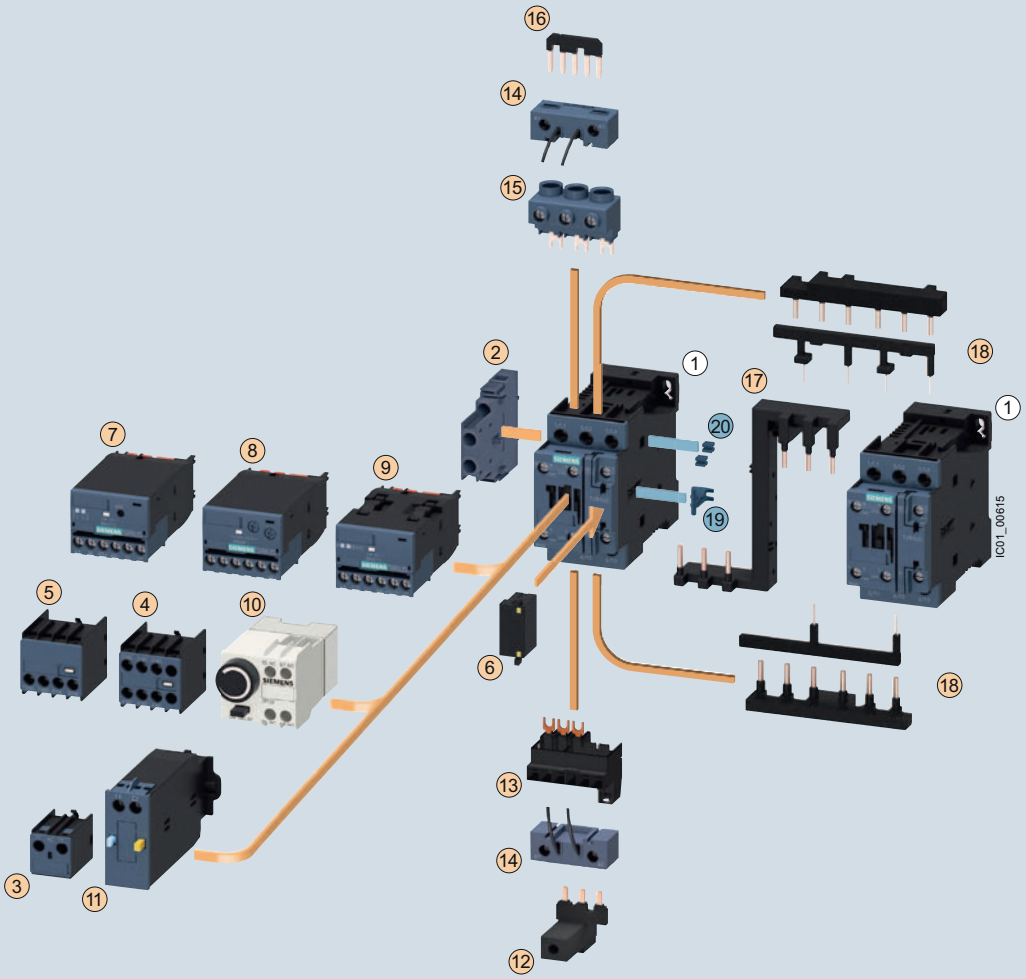
(16) Wiring modules on the top and bottom for connecting the main, auxiliary and control current paths, electrical interlock[1] included (NC contact interlock), can be broken off (NC contact interlock)
(17) Mechanical interlocks[2]
(18) Two connecting clips for two contactors[2]

○ For contactors
● For contactors and coupling contactors

[1] 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

[2] The parts (17) and (18) can only be ordered together as 3RA2912-2H mechanical connectors.

3RT2 contactors
Size S0 with mountable accessories



(1) Contactor size S0

(2) 2-pole auxiliary switch block, laterally mountable
(3) 1-pole auxiliary switch block, for snapping onto the front cable entry from the top
(4) 4-pole auxiliary switch block, for snapping onto the front
(5) 2-pole auxiliary switch block, for snapping onto the front cable entry from the bottom
(6) Surge suppressor with/without LED
(7) 3RA27 function module for AS-Interface, direct starting
(8) 3RA28 function module
(9) 3RA27 function module for IO-Link, direct starting
(10) Pneumatically delayed auxiliary switch block
(11) Mechanical latching block

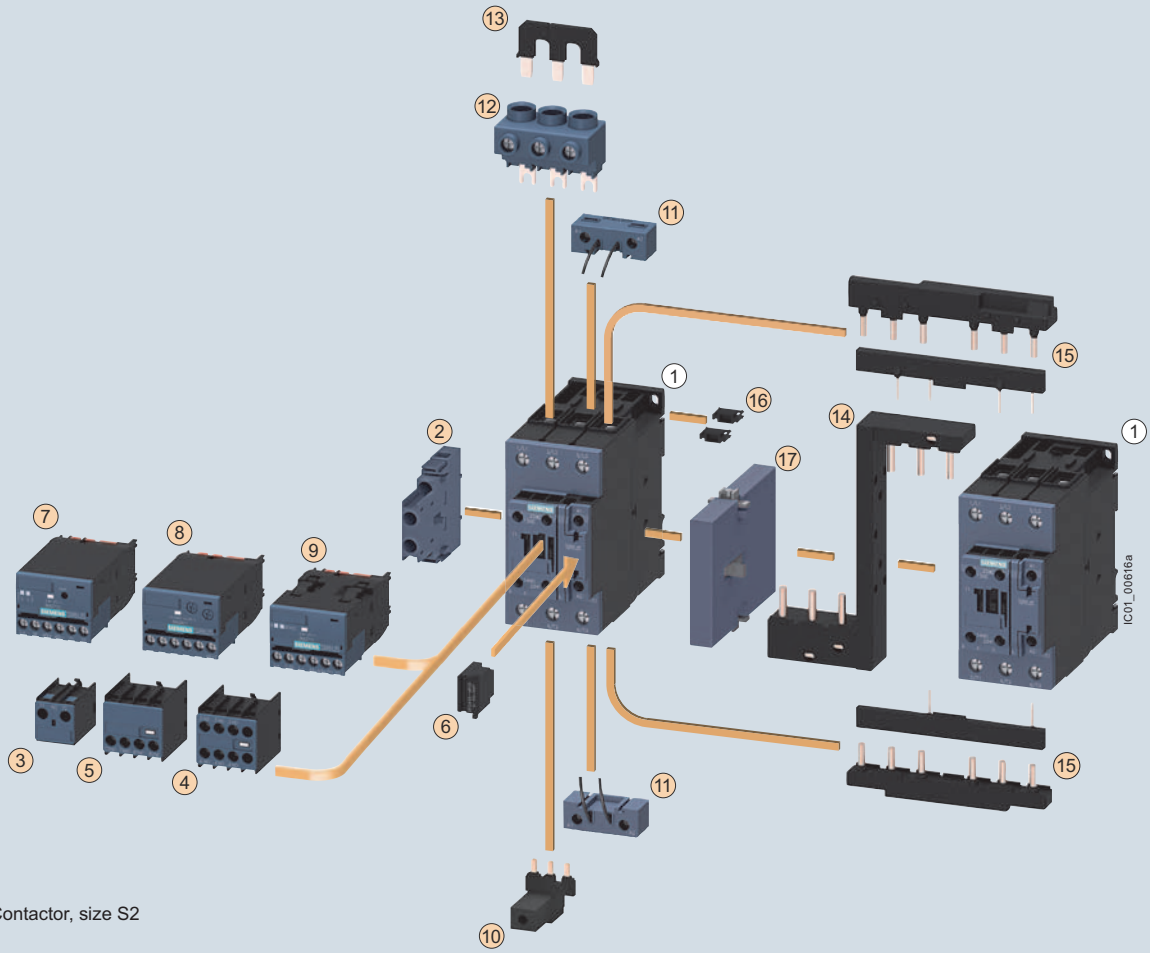
(12) Link for paralleling, 3-pole, with connecting terminal
(13) Connection module (adapter and plug) for contactors with screw-type connection
(14) Coil terminal module, on the top and bottom
(15) Three-phase feeder terminal
(16) Link for paralleling (star jumper), 3-pole, without connecting terminal
(17) Safety main current connector for two contactors

Assembly kit 3RA2923-2AA1 comprising:

(18) Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)
(19) Mechanical interlocks [1)]
(20) Two connecting clips for two contactors [1)]

For contactors
For contactors and coupling contactors

[1)] The parts (19) and (20) can only be ordered together as 3RA2912-2H mechanical connectors.



1 Contactor, size S2

2 2-pole auxiliary switch block, laterally mountable
3 1-pole auxiliary switch block, for snapping onto the front, cable entry from above
4 4-pole auxiliary switch block, for snapping onto the front
5 2-pole auxiliary switch block, for snapping onto the front, cable entry from below
6 Surge suppressor with/without LED
7 3RA27 function modules for AS-Interface, direct-on-line starting
8 3RA28 function modules
9 3RA27 function modules for IO-Link, direct-on-line starting
10 Link for paralleling, 3-pole, with connection terminal
11 Coil terminal module, top and bottom
12 Three-phase feeder terminal
13 Link for paralleling (star jumper), 3-pole, without connection terminal
14 Safety main current connector for two contactors

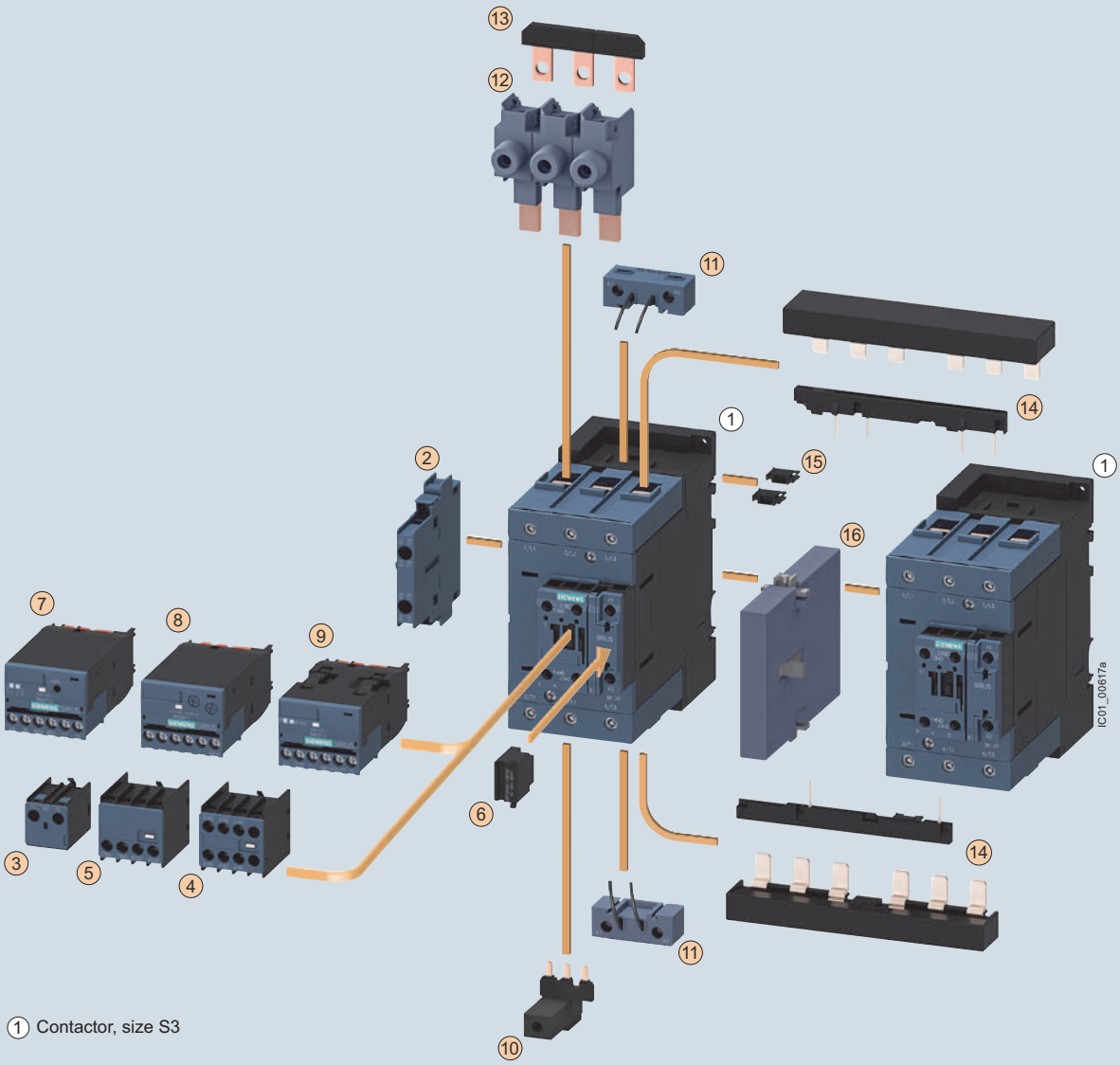
Assembly kit 3RA2933-2AA1 comprising:

15 Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)
16 Two connecting clips for two contactors

To be ordered separately:

17 Mechanical interlocks

Accessories see pages 2/68 to 2/83.



(1) Contactor, size S3

(2) 2-pole auxiliary switch block, laterally mountable
(3) 1-pole auxiliary switch block, for snapping onto the front, cable entry from above
(4) 4-pole auxiliary switch block, for snapping onto the front
(5) 2-pole auxiliary switch block, for snapping onto the front, cable entry from below
(6) Surge suppressor with/without LED
(7) 3RA27 function modules for AS-Interface, direct-on-line starting
(8) 3RA28 function modules
(9) 3RA27 function modules for IO-Link, direct-on-line starting

(10) Links for paralleling, 3-pole, with connection terminal
(11) Coil terminal module, top and bottom
(12) Single-phase infeed terminals (3 units)
(13) Links for paralleling (star jumper), 3-pole without connecting terminal

Assembly kit 3RA2943-2AA1 comprising:

(14) Wiring modules on the top and bottom for connecting the main, auxiliary and control current paths, electrical interlock[1] included, can be broken off (NC contact interlock)
(15) Two connectors for two contactors

To be ordered separately:

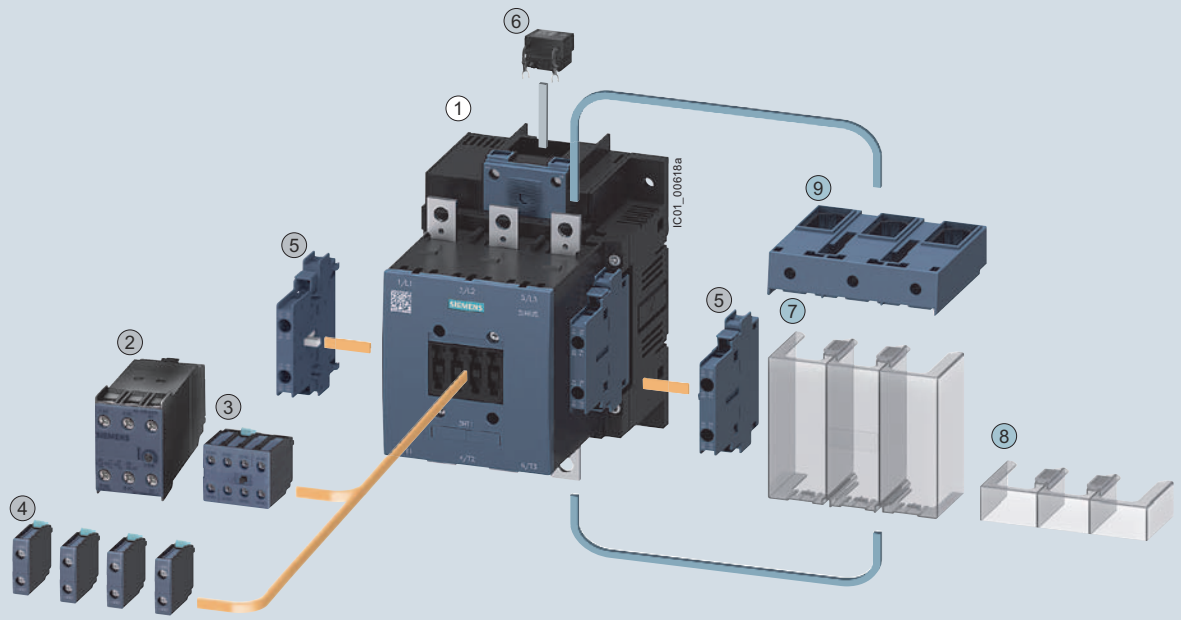
(16) Mechanical interlock

[1] 3RT201. contactors with one NC contact in the basic unit are required for the electrical interlock. An additional NO contact is required for momentary-contact operation.

Accessories see pages 2/68 to 2/83.

Motor Starters see Chapter 4 Combination Starters & Starters for group installation

(illustration for basic unit)



(1) 3RT10 and 3RT14 air-break contactor, sizes S6, S10 and S12

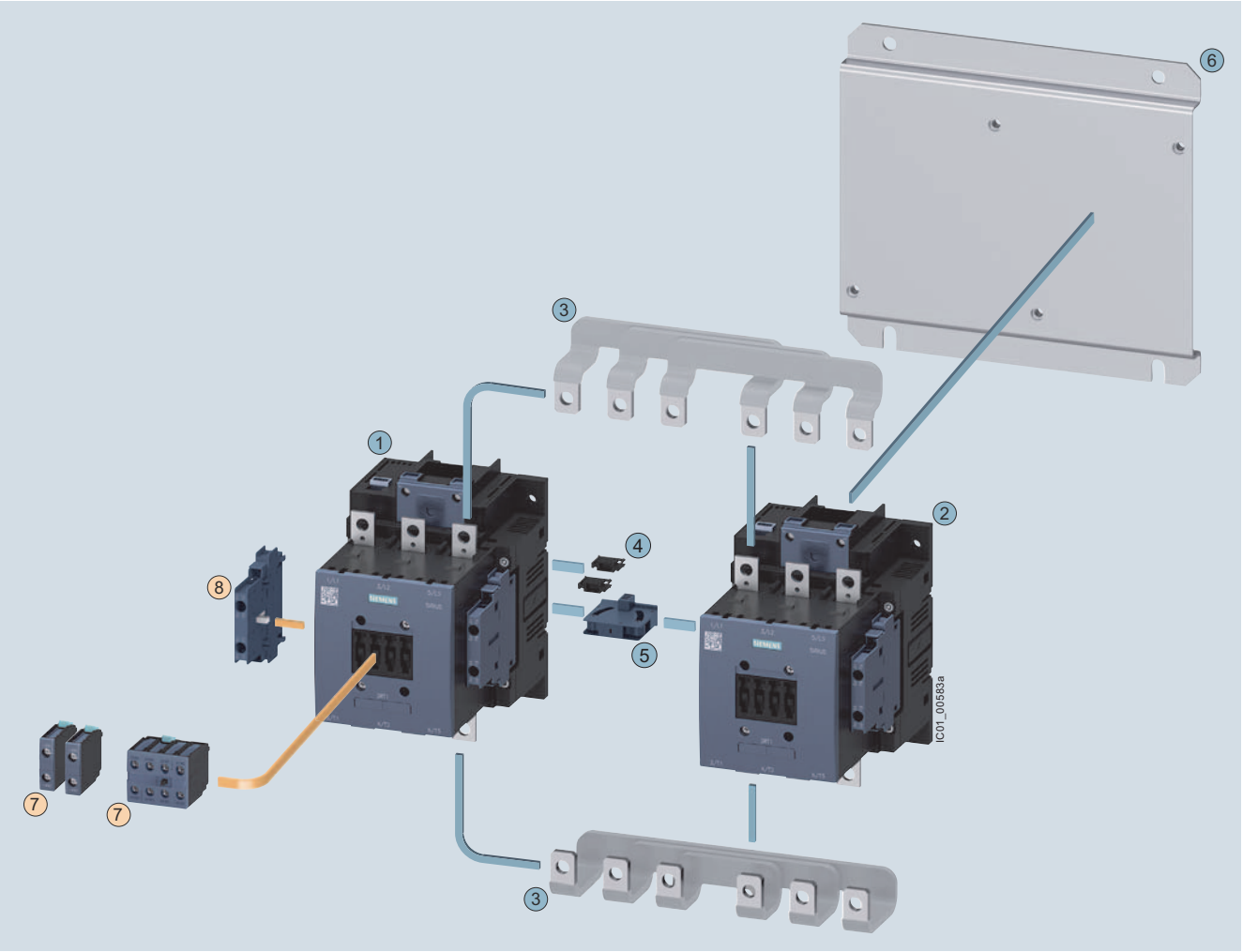
(2) Auxiliary switch block, solid-state time-delay (ON or OFF-delay or star-delta (wye-delta) starting)
(3) 4-pole auxiliary switch block
(4) 1-pole auxiliary switch block (up to 4 can be snapped on)
(5) 2-pole auxiliary switch block, laterally mountable left or right
(6) Surge suppressor (RC element) for plugging into top of withdrawable coil

(7) Terminal cover for cable lug and busbar connection
(8) Terminal cover for box terminal
(9) Box terminal block

Accessories identical for sizes S6 to S12
Different accessories for sizes S6 and S10/S12

For accessories see pages 2/68 to 2/85.

For mountable overload relays see Chapter 3, "Overload Relays".



Mountable accessories (optional)

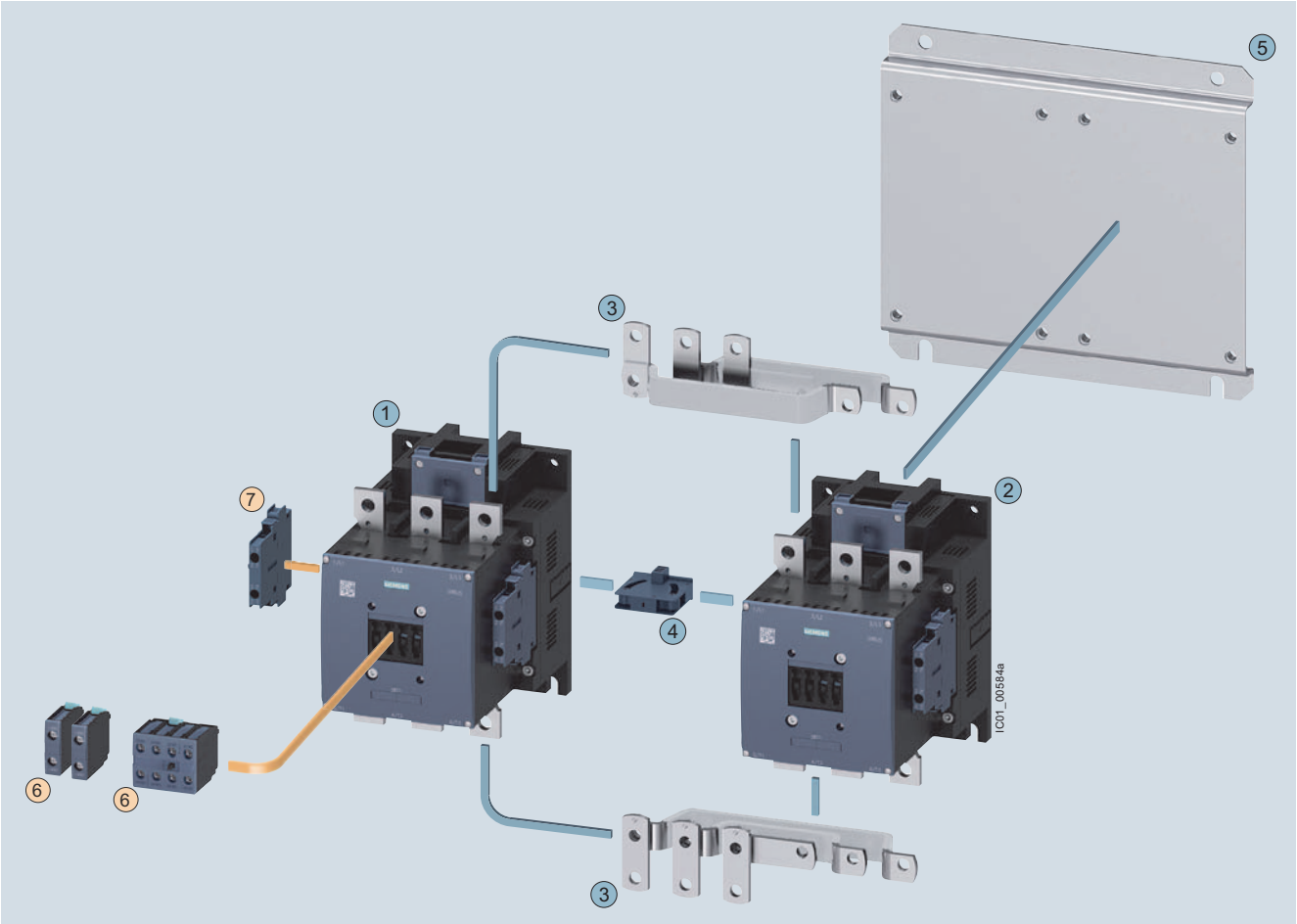
To be ordered separately		Type
6	Auxiliary switch block, front	3RH1921
7	Auxiliary switch block, lateral	3RH1921

Reversing contactor assembly for customer assembly

Individual parts		Type Q11	Type Q12
1 2	Contactors, 55 kW	3RT1.54	3RT1.54
1 2	Contactors, 75 kW	3RT1.55	3RT1.55
1 2	Contactors, 90 kW	3RT1.56	3RT1.56
3	Assembly kit consisting of: Wiring modules on the top and bottom for contactors without box terminals for connecting the main and auxiliary circuits, electrical interlock included (NC contact interlock)	3RA1953-2A	
4	Two connectors for two contactors	3RA1932-2D	
5	Mechanical interlock (must be ordered separately)	3RA1954-2A	
6	Base plate for reversing contactor assemblies	3RA1952-2A	

For accessories see pages 2/68-2/85.

Mountable overload relays see Chapter 3, "Overload Relays".



Mountable accessories (optional)

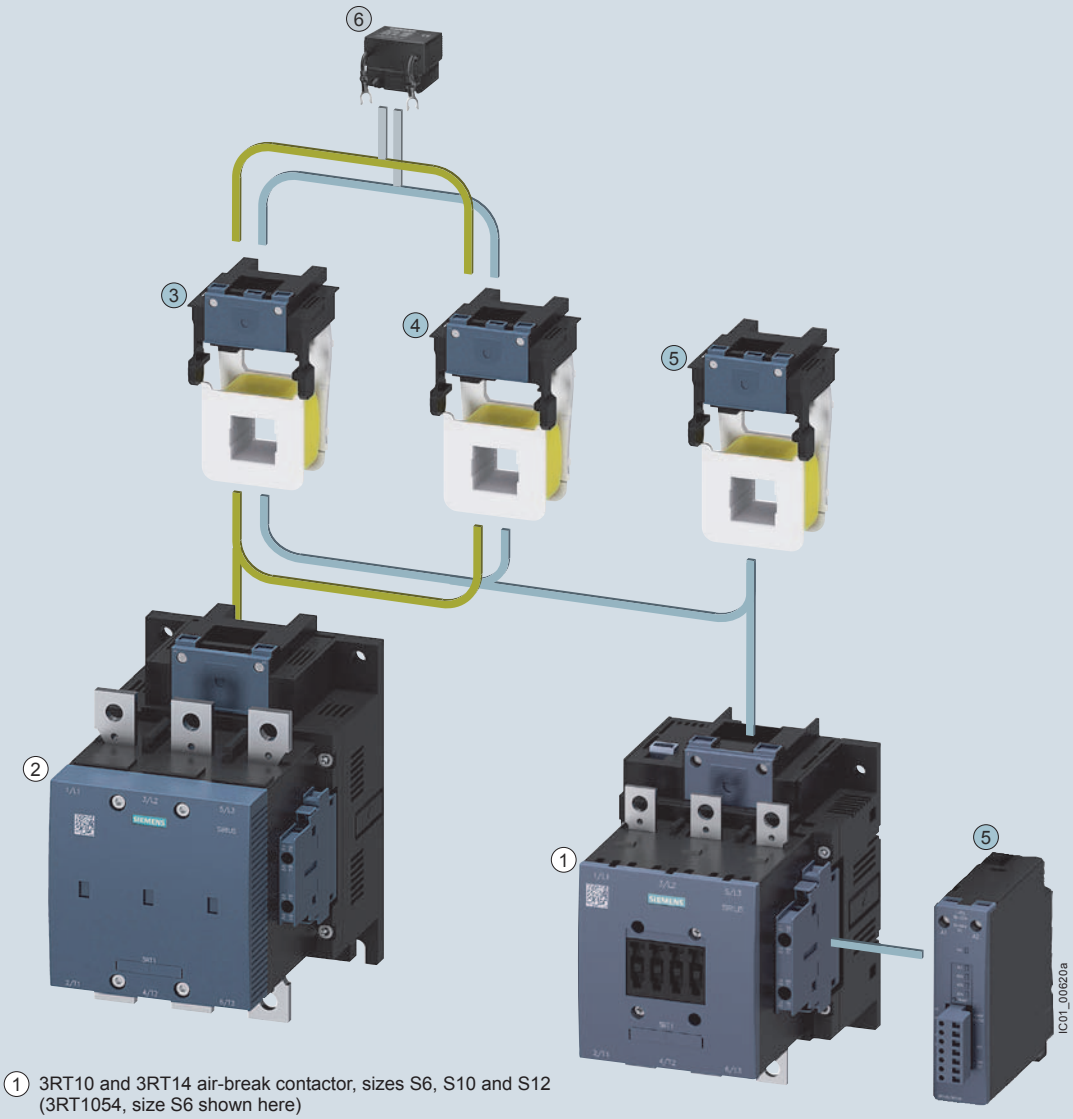
To be ordered separately		Type
6	Auxiliary switch block, front	3RH1921
7	Auxiliary switch block, lateral	3RH1921

Reversing contactor assembly for customer assembly

Individual parts		Type Q11	Q12
1 2	Contactors, 110 kW	3RT1.64	3RT1.64
1 2	Contactors, 132 kW	3RT1.65	3RT1.65
1 2	Contactors, 160 kW	3RT1.66	3RT1.66
3	Assembly kit consisting of: Wiring modules on the top and bottom for contactors without box terminals for connecting the main and auxiliary circuits, electrical interlock included (NC contact interlock)	3RA1963-2A	
4	Mechanical interlock (must be ordered separately)	3RA1954-2A	
5	Base plate for reversing contactor assemblies	3RA1962-2A	

For accessories see pages 2/68-2/85.

For mountable overload relays see Chapter 3, "Overload Relays".



(1) 3RT10 and 3RT14 air-break contactor, sizes S6, S10 and S12
(3RT1054, size S6 shown here)

(2) 3RT12 vacuum contactor, sizes S10 and S12
(3RT1266, size S10 shown here)

(3) Withdrawable coils for 3RT1...-.**A**... contactors with conventional operating mechanism
(size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors)
(size S12: the same for air-break and vacuum contactors)

(4) Withdrawable coils for 3RT1...-.**N**... contactors with solid-state operating mechanism.
(size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors)
(size S12: the same for air-break and vacuum contactors)

(5) Withdrawable coils and laterally mountable module (plug-on) for 3RT1...-.**P**... air-break contactors with solid-state operating mechanism and remaining lifetime indicator

(6) Surge suppressor (RC element), plug-mountable on withdrawable coils
- 3RT1...-.**A**... with conventional operating mechanism
- 3RT1...-.**N**... with solid-state operating mechanism

◯ Same accessories for sizes S6 to S12

◯ Different accessories depending on size

For surge suppressors see page 2/75,
withdrawable coils see page 2/100.

For mountable overload relays see Chapter 3,
"Overload Relays".

Selection and ordering data


3RH2911-1HA01


3RH2911-2HA01


3RH19 21-1HA. .


3RH19 21-2HA . .

For contactors/ control relays	Rated operational Current [3] 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts Version NO	NC	NO	NC	Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
Type									
Auxiliary switch blocks for snapping onto the front according to EN 50012 (also compliant with the requirements according to EN 50005)									
Size S00 [2]									
For assembling contactors with 2, 3, 4, or 5 auxiliary contacts									
3RT201., Ident. No. 10E 3RT231. 3RT251.	**11E**			—	1	—	—	**3RH2911-1HA01**	**3RH2911-2HA01**
	12E			—	2	—	—	**3RH2911-1HA02**	**3RH2911-2HA02**
	13E			—	3	—	—	**3RH2911-1HA03**	**3RH2911-2HA03**
	21E			1	—	—	—	**3RH2911-1HA10**	**3RH2911-2HA10**
	21E			1	1	—	—	**3RH2911-1HA11**	**3RH2911-2HA11**
	22E			1	2	—	—	**3RH2911-1HA12**	**3RH2911-2HA12**
	23E			1	3	—	—	**3RH2911-1HA13**	**3RH2911-2HA13**
	31E			2	—	—	—	**3RH2911-1HA20**	**3RH2911-2HA20**
	31E			2	1	—	—	**3RH2911-1HA21**	**3RH2911-2HA21**
	32E			2	2	—	—	**3RH2911-1HA22**	**3RH2911-2HA22**
	41E			3	—	—	—	**3RH2911-1HA30**	**3RH2911-2HA30**
	41E			3	1	—	—	**3RH2911-1HA31**	**3RH2911-2HA31**
Size S0 to S3									
For assembling contactors with 3, 4, or 5 auxiliary contacts									
3RT202. , Ident. No. 11E 3RT232. 3RT252. 3RT203. 3RT233. 3RT235.	**12E**			—	1	—	—	**3RH2911-1HA01**	**3RH2911-2HA01**
	13E			—	2	—	—	**3RH2911-1HA02**	**3RH2911-2HA02**
	14E			—	3	—	—	**3RH2911-1HA03**	**3RH2911-2HA03**
	21E			1	—	—	—	**3RH2911-1HA10**	**3RH2911-2HA10**
	22E			1	1	—	—	**3RH2911-1HA11**	**3RH2911-2HA11**
	23E			1	2	—	—	**3RH2911-1HA12**	**3RH2911-2HA12**
	24E			1	3	—	—	**3RH2911-1HA13**	**3RH2911-2HA13**
	31E			2	—	—	—	**3RH2911-1HA20**	**3RH2911-2HA20**
	32E			2	1	—	—	**3RH2911-1HA21**	**3RH2911-2HA21**
	33E			2	2	—	—	**3RH2911-1HA22**	**3RH2911-2HA22**
	41E			3	—	—	—	**3RH2911-1HA30**	**3RH2911-2HA30**
	42E			3	1	—	—	**3RH2911-1HA31**	**3RH2911-2HA31**
Auxiliary switch blocks for snapping onto the front according to EN 50012									
Sizes S6 to S12									
4-pole									
3RT1. 4 to 3RT1. 7, 3RT11.	**22**		(with location digits 5, 6, 7, 8)	2	2	—	—	**3RH1921-1XA22-0MA0**	**3RH1921-2XA22-0MA0**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/204-2/208.
For int. circuit diagrams see page 2/192.
3RH29 aux blocks are not intended for use with 3RT1 or 3RH1 contactors and relays.
3RH19 aux blocks are not intended for use with 3RT2 or 3RH2 contactors and relays.
For auxiliary switch blocks for 3RH2140 and 3RH2440 see page 2/53.

1) The 3RH2911-.HA.. aux. switches are available with ring-lug terminals. Replace the 8th digit of the Order No. with a "4".

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

3) UL ratings: See appendix page 19/7

Selection and ordering data


3RH2911-1FA40


3RH2911-2FA40


3RH19 21-1C. . .


3RH19 21-2C . . .


3RH19 21-1LA . .


3RH19 21-1MA..

For contactors/ control relays	Rated operational Current [3] 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts Version Type				**Screw Terminals**[1] Order No.	**Spring Terminals**[1] Order No.
				NO	NC	NO	NC		
Auxiliary switch blocks for snapping onto the front according to EN 50005									
Sizes S00 to S3									
2- or 4-pole auxiliary switch blocks for assembling contactors with 3 and 5 or 4 and 6 auxiliary contacts									
3RT2. 1.,	**40**			4	—	—	—	**3RH2911-1FA40**	**3RH2911-2FA40**
3RT2. 2.,	**22**			2	2	—	—	**3RH2911-1FA22**	**3RH2911-2FA22**
3RT2. 3.,	**04** [1]			—	4	—	—	**3RH2911-1FA04**	**3RH2911-2FA04**
3RH21 ..,	**11** [2]			—	—	1	1	**3RH2911-1FB11**	**3RH2911-2FB11**
3RH24 ..	**22** [2]			1	1	1	1	**3RH2911-1FB22**	**3RH2911-2FB22**
	22 [2]			—	—	2	2	**3RH2911-1FC22**	**3RH2911-2FC22**
1- and 2- pole auxiliary switch blocks, cable entry from above or below									
3RT2. 1.,	**10**		Top	1	—	—	—	**3RH2911-1AA10**	—
3RT2. 2.,			Bottom	1	—	—	—	**3RH2911-1BA10**	—
3RT2. 3.,	**01**		Top	—	1	—	—	**3RH2911-1AA01**	—
3RH21 ..,			Bottom	—	1	—	—	**3RH2911-1BA01**	—
3RH24 ..	**11**		Top	1	1	—	—	**3RH2911-1LA11**	—
			Bottom	1	1	—	—	**3RH2911-1MA11**	—
	20		Top	2	—	—	—	**3RH2911-1LA20**	—
			Bottom	2	—	—	—	**3RH2911-1MA20**	—
Sizes S6 to S12									
Single-pole auxiliary switch blocks (also compliant with EN 5001[2]**)**									
3RT1. 4 to	—			1	—	—	—	**3RH1921-1CA10**	**3RH1921-2CA10**
3RT1. 7,	—			—	1	—	—	**3RH1921-1CA01**	**3RH1921-2CA01**
3RT11	—			—	—	1	—	**3RH1921-1CD10**	—
	—			—	—	—	1	**3RH1921-1CD01**	—

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/204-2/208.
For int. circuit diagrams see page 2/192.

1) Mounting is permitted only on basic units which have no integrated NC contact.

2) Version with early make and delayed break contacts

3) UL ratings: See appendix page 19/7

Selection and ordering data


3RH2911-1DA02


3RH2911-2DA02


3RH19 21-1EA. .
-1KA. .


3RH2921-1DA02

For contactors/ control relays	Rated operational Current [4] 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version NO	NC	Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
Type							
Laterally mountable auxiliary switch blocks according to EN 50012							
Laterally mountable auxiliary switch block, 2-pole							
Size S00 [1) 2)]							
3RT201.	A600/Q600	**12E**	right or left	—	2	**3RH2911-1DA02**	**3RH2911-2DA02**
Ident. No. 10E	A600/Q600	**21E**	right or left	1	1	**3RH2911-1DA11**	**3RH2911-2DA11**
Size S0 to S3							
3RT2.2. [3]	A600/Q600	**13E**	right or left	—	2	**3RH2921-1DA02**	**3RH2921-2DA02**
Ident.No. 11E	A600/Q600	**22E**	right or left	1	1	**3RH2921-1DA11**	**3RH2921-2DA11**
3RT2.3.	A600/Q600	**31E**	right or left	2	—	**3RH2921-1DA20**	**3RH2921-2DA20**
First laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1. 3 to 3RT1. 7	A600/Q600		right or left	1	1	**3RH1921-1DA11**	**3RH1921-2DA11**
Second laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1. 4 to 3RT1. 7	A300/Q300		right or left	1	1	**3RH1921-1JA11**	**3RH1921-2JA11**
Laterally mountable auxiliary switch blocks according to EN 50005							
First laterally mountable auxiliary switch block, 2-pole							
Sizes S00 [1) 2)]							
3RT2.1.	A600/Q600	**02**	right or left	—	2	**3RH2911-1DA02**	**3RH2911-2DA02**
Ident.No. 10E	A600/Q600	**11**	right or left	1	1	**3RH2911-1DA11**	**3RH2911-2DA11**
	A600/Q600	**20**	right or left	2	—	**3RH2911-1DA20**	**3RH2911-2DA20**
Sizes S0 to S3							
3RT2.2.,	A600/Q600	**02**	right or left	—	2	**3RH2921-1DA02**	**3RH2921-2DA02**
3RT2.3.[3]	A600/Q600	**11**	right or left	1	1	**3RH2921-1DA11**	**3RH2921-2DA11**
	A600/Q600	**20**	right or left	2	—	**3RH2921-1DA20**	**3RH2921-2DA20**
Sizes S6 to S12							
3RT1. 4 to	A300/Q300		right or left	—	2	**3RH1921-1EA02**	**3RH1921-2EA02**
3RT1. 7	A300/Q300		right or left	1	1	**3RH1921-1EA11**	**—**
	A300/Q300		right or left	2	—	**3RH1921-1EA20**	**3RH1921-2EA20**
Second laterally mountable auxiliary switch block, 2-pole							
Sizes S6 to S12							
3RT1. 4 to	A300/Q300		right or left	—	2	**3RH1921-1KA02**	**3RH1921-2KA02**
3RT1. 7	A300/Q300		right or left	1	1	**3RH1921-1KA11**	**—**
	A300/Q300		right or left	2	—	**3RH1921-1KA20**	**3RH1921-2KA20**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/204-2/208.
For int. circuit diagrams see pages 2/192-2/197.

1) With size S00, mounting according to EN 50012 is permitted only on basic units which have no NC contact integrated.

2) Ident. No. 41, 32 and 23 according to EN 50012 is also possible. Please note the corresponding circuit diagrams for mounting 3RH29 11-1DA.. on the left.

3) With 3RT23 2., 3RT25. 2. mountable only on the right.

4) UL ratings: See appendix page 19/7

Selection and ordering data

- Operation in dusty atmospheres
- Solid-state circuits with rated operational currents I_e/AC-14 and DC-13 from 1 … 300 mA at 3 … 60 V
- Hard gold-plated contacts
- Mirror contacts according to EN 60947-4-1, Appendix F, for laterally mountable auxiliary switches

Selection and ordering data


3RH2911-1NF02


3RH2911-2NF02


3RH2911-2DE11


3RH1921-2DE11


3RH29 21-2DE11

For contactors/ control relays	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version NO	NC	NO	NC	Screw Terminals[1] Order No.	Spring Terminals[1] Order No.
Type								
Solid-state compatible auxiliary switch blocks for snapping onto the front according to EN 50005 [1]								
Sizes S00 to S3								
3RT2. 1.,	**02**		—	—	—	2	**3RH2911-1NF02**	**3RH2911-2NF02**
3RT2.2., 3RT2.3.	**11**		1	—	—	1	**3RH2911-1NF11**	**3RH2911-2NF11**
3RH21 .., 3RH24 ..	**20**		2	—	—	—	**3RH2911-1NF20**	**3RH2911-2NF20**
Sizes S6 to S12								
3RT1. 4 to	—		1	1	1	1	**3RH1921-1FE22**	**3RH19 21-2FE22**
3RT1. 7	—		—	2	2	—		**3RH1921-2FJ22**
Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50012								
First laterally mountable auxiliary switch block, 2-pole								
Size S00 [2]								
3RT2. 1., Ident. No. 10E	**21E**	right	1	—	—	1	—	**3RH2911-2DE11**
Size S0 to S3								
3RT2. 2, 3RT2. 3 Ident. No. 10E	**22E**	right	1	—	—	1	—	**3RH2921-2DE11**
Sizes S6 to S12								
3RT1. 4 to 3RT1 . 7		right or left	1	—	—	1	—	**3RH1921-2DE11**
Second laterally mountable auxiliary switch block, 2-pole								
Sizes S6 to S12								
3RT1. 4 to 3RT1. 7		right or left	1	—	—	1	—	**3RH1921-2JE11**
Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50005								
Size S00								
3RT2. 1., Ident. No. 10E	**11**	right or left	1	—	—	1	—	**3RH2911-2DE11**
Size S0 to S2								
3RT2. 2., 3RT2. 3	**11**	right or left	1	—	—	1	—	**3RH2921-2DE11**

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/204 -2/208.
For int. circuit diagrams see pages 2/192-2/197.

1) The 3RH29 11-.NF.. auxiliary switches are also available with ring lug terminal connection. The 8th digit of the order number must be replaced with "4", e. g.: 3RH2911-1NF11 -> 3RH2911-4NF11

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

Selection and ordering data

	For contactors	Rated control supply voltage U_s [1]	Time setting range t	Output / auxiliary contacts	Screw Terminals Order No.	Spring Terminals Order No.
	Type	V	Sec			
Time-delay, solid-state auxiliary switch blocks for snapping onto the front according to DIN 46199-5						
	The electrical connection between the solid-state time-delay auxiliary switch and the contactor underneath is established automatically when it is snapped on and locked into place.					
	Sizes S00 to S3					
3RA2813-1AW10 		**ON-delay (varistor integrated)**				
	3RT2., 3RH21 [2] 3RH24	24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA2813-1AW10** **3RA2813-1FW10**	**3RA2813-2AW10** **3RA2813-2FW10**
		OFF-delay with auxiliary voltage (varistor integrated)				
		24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA28 14-1AW10** **3RA28 14-1FW10**	**3RA28 14-2AW10** **3RA28 14-2FW10**
		OFF-delay without auxiliary voltage[3] (varistor integrated)				
		24 … 240 AC/DC	0.05 … 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	**3RA2815-1AW10** **3RA2815-1FW10**	**3RA2815-2AW10** **3RA2815-2FW10**
	Sizes S6 to S12					
3RT1926-2FJ11 		**ON-delay (varistor integrated)**				
	3RT10, 3RT13, 3RT14, 3RT15	24 AC/DC [4]	0.05 … 1 0.5 … 10 5 … 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2EJ11** **3RT19 26-2EJ21** **3RT19 26-2EJ31**	— — —
		100 … 127 AC [4]	0.05 … 1 0.5 … 10 5 … 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2EC11** **3RT19 26-2EC21** **3RT19 26-2EC31**	— — —
		200 … 240 AC [4]	0.05 … 1 0.5 … 10 5 … 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2ED11** **3RT19 26-2ED21** **3RT19 26-2ED31**	— — —
		OFF-delay without auxiliary voltage [5]				
		24 AC/DC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FJ11** **3RT19 26-2FJ21** **3RT19 26-2FJ31**	— — —
		100 … 127 AC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FK11** **3RT19 26-2FK21** **3RT19 26-2FK31**	— — —
		200 … 240 AC [4]	0.05 … 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	**3RT19 26-2FL11** **3RT19 26-2FL21** **3RT19 26-2FL31**	— — —
		WYE-delta function				
		24 AC/DC [4] 100 … 127 AC [4] 200 … 240 AC [4]	1.5 … 30 1.5 … 30 1.5 … 30	each have: 1 NO delayed 1 NO instant interval 50ms	**3RT19 26-2GJ51** **3RT19 26-2GC51** **3RT19 26-2GD51**	— — —

For technical data, see pages 2/184-2/185.
For int. circuit diagrams, see page 2/200.
For position of terminals, see page 2/208.

When the solid-state time-delay auxiliary switches are used, no other auxiliary switches are allowed to be mounted on the basic units.

1) AC voltage values apply for 50 Hz and 60 Hz.

2) Cannot be fitted onto coupling relays.

3) Setting of output contacts in as-supplied state not defined (bistable relay). Application of the control supply voltage once results in contact change-over to the correct setting.

4) Terminals A1 and A2 for the rated control supply voltage of the solid-state time-delay auxiliary switch must be connected to the associated contactor by means of connecting leads.

5) Position of the output contacts not defined in the as-delivered state (bistable relay). Applying the control voltage once results in the contacts switching to the correct position.

Selection and ordering data


3RA2812-1DW10


3RA2811-2CW10

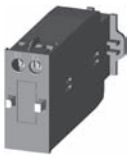
For contactors	Rated control supply voltage U_s [1]	Time setting range *t*	Screw terminals	Spring-type terminals	Weight
			Order No.	Order No.	
Type	V AC/DC	s			kg
Timing relays for mounting on 3RT2 contactors					
	Sizes S00 to S3				
	The electrical connection between the timing relay and the contactor underneath is established automatically when it is snapped on and locked.				
	ON-delay Two-wire design, varistor integrated				
3RT20.., 3RT23.., 3RT25.., 3RH21[2], 3RH24	24 ... 240	0.05 ...100 (1, 10, 100; selectable)	**3RA2811-1CW10**	**3RA2811-2CW10**	
3RT203.	24 ... 90	0.05 ...100 (1, 10, 100; selectable)	**3RA2831-1DG10**	**3RA2831-2DG10**	
	90 ... 240		**3RA2831-1DH10**	**3RA2831-2DH10**	
	OFF-delay with control signal Varistor integrated				
3RT20.., 3RT23.., 3RT25.., 3RH21[2], 3RH24	24 ... 240	0.05 ...100 (1, 10, 100; selectable)	**3RA2812-1DW10**	**3RA2812-2DW10**	
3RT203.	24 ... 90	0.05 ...100 (1, 10, 100; selectable)	**3RA2832-1DG10**	**3RA2832-2DG10**	
	90 ... 240		**3RA2832-1DH10**	**3RA2832-2DH10**	

1) AC voltage values apply for 50 Hz and 60 Hz.
2) Cannot be fitted onto coupling relays.

For description, see page 2/121.
For technical data, see page 2/184.
For circuit diagrams, see page 2/200.

1) AC voltage ratings apply for 50 and 60 Hz.
2) The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".
3) Cannot be fitted onto coupling relays

Selection and ordering data

	For contactors Type	Rated control supply voltage U_s [1] V	Time setting range t sec	**Screw Terminals** [2] Order No.	Weight approx. kg
Off-delay device					
3RT2916-2B.01 	***Sizes S00 to S2***				
	For contactors with DC operation. Non-adjustable delay time				
	3RT2., 3RH2. . .-1BF40	110 AC/DC	S00: > 0.1 S0: > 0.08; S2: > 0.25	**3RT2916-2BK01**	0.150
	3RT2., 3RH2. . .-1BM40	220 ... 230 AC/DC	S00: > 0.5 S0: > 0.3; S2: > 0.8	**3RT2916-2BL01**	0.150
	3RT2., 3RH2. . .-1BB40	24 DC	S00: > 0.2 S0: > 0.1; S2: > 0.1	**3RT2916-2BE01**	0.150
3RT2916-2BE01 	***Sizes S3***				
	3RT2. 4	24 DC	S3: 70 fixed	**3RT2916-2BE01**	0.093
Pneumatic delay blocks, terminal designation according to EN 50005 [4]					
3RT2926-2PA01 	***Size S0***				
	For snapping onto the front of contactors [5] **Auxiliary contacts 1 NO and 1 NC**				
	With ON-delay 3RT2. 2	—	0.1 ... 30 1 ... 60	**3RT2926-2PA01** **3RT2926-2PA11**	0.080 0.080
	With OFF-delay 3RT2. 2	—	0.1 ... 30 1 ... 60	**3RT2926-2PR01** **3RT2926-2PR11**	0.080 0.080
Mechanical latching blocks					
3RT2926-3AB31 	**For mounting onto the front of contactors** **The contactor remains in the energized state even after voltage failure**				
	Size S0				
	3RT2. 2	24 AC/DC	—	**3RT2926-3AB31**	0.100
		110 AC/DC	—	**3RT2926-3AF31**	0.100
		230 AC/DC	—	**3RT2926-3AP31**	0.100

For description, see page 2/121.
For technical data, see page 2/184.
For circuit diagrams, see page 2/200.

1) AC voltage ratings apply for 50 and 60 Hz.

2) The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".

3) Cannot be fitted onto coupling relays

4) Versions according to DIN VDE 0116 on request.

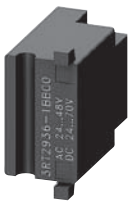
5) In addition to these, no other auxiliary contacts are permitted.

Selection and ordering data

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	Order No.	Weight kg
Surge suppressors without LED (also for spring-type terminals)					
Size S00					
	For plugging onto the front side of the contactors (with and without auxiliary switch block)				
3RT2.1, 3RH2.	**Varistors**	24 ... 48	24 ... 70	**3RT2916-1BB00**	
		48 ... 127	70 ... 150	**3RT2916-1BC00**	
		127 ... 240	150 ... 250	**3RT2916-1BD00**	
		240 ... 400	--	**3RT2916-1BE00**	
		400 ... 600	--	**3RT2916-1BF00**	
3RT2.1, 3RH2.	**RC elements**	24 ... 48	24 ... 70	**3RT2916-1CB00**	
		48 ... 127	70 ... 150	**3RT2916-1CC00**	
		127 ... 240	150 ... 250	**3RT2916-1CD00**	
		240 ... 400	--	**3RT2916-1CE00**	
		400 ... 600	--	**3RT2916-1CF00**	
3RT2.1, 3RH2.	**Noise suppression diodes**	--	12 ... 250	**3RT2916-1DG00**	
3RT2.1, 3RH2.	**Diode assemblies** (diode and Zener diode) for DC operation	--	12 ... 250	**3RT2916-1EH00**	
Size S0					
	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)				
3RT2.2	**Varistors** [2]	24 ... 48	24 ... 70	**3RT2926-1BB00**	
		48 ... 127	70 ... 150	**3RT2926-1BC00**	
		127 ... 240	150 ... 250	**3RT2926-1BD00**	
		240 ... 400	--	**3RT2926-1BE00**	
		400 ... 600	--	**3RT2926-1BF00**	
3RT2.2	**RC elements**	24 ... 48	24 ... 70	**3RT2926-1CB00**	
		48 ... 127	70 ... 150	**3RT2926-1CC00**	
		127 ... 240	150 ... 250	**3RT2926-1CD00**	
		240 ... 400	--	**3RT2926-1CE00**	
		400 ... 600	--	**3RT2926-1CF00**	
3RT2.2	**Diode assembly** for DC operation	--	24	**3RT2926-1ER00**	
		--	30 ... 250	**3RT2926-1ES00**	
Size S2 and S3					
	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)				
3RT2.3. 3RT2.4.	**Varistors** [2][3]	24 ... 48	24 ... 70	**3RT2936-1BB00**	
		48 ... 127	70 ... 150	**3RT2936-1BC00**	
		127 ... 240	150 ... 250	**3RT2936-1BD00**	
		240 ... 400	--	**3RT2936-1BE00**	
		400 ... 600	--	**3RT2936-1BF00**	
3RT2.3.	**RC elements**	24 ... 48	24 ... 70	**3RT2936-1CB00**	
		48 ... 127	70 ... 150	**3RT2936-1CC00**	
		127 ... 240	150 ... 250	**3RT2936-1CD00**	
		240 ... 400	--	**3RT2936-1CE00**	
		400 ... 600	--	**3RT2936-1CF00**	
3RT2.3. 3RT2.4.	**Diode assembly** [3] for DC operation	--	24	**3RT2936-1ER00**	
		--	30 ... 250	**3RT2936-1ES00**	
Size S3					
	For plugging into the two recesses on the left next to the connection block for auxiliary switches and coils A1 and A2. The connecting cables are wired to A1 and A2.				
3RT2.4	**RC elements**	24 ... 48	24 ... 70	**3RT2946-1CB00**	
		48 ... 127	70 ... 150	**3RT2946-1CC00**	
		127 ... 240	150 ... 250	**3RT2946-1CD00**	
		240 ... 400	--	**3RT2946-1CE00**	
		400 ... 600	--	**3RT2946-1CF00**	


3RT2916-1B.00


3RT2926-1E.00


3RT2936-1B.00


3RT2936-1E.00

3RT2946-1C.00

[1] Can be used for AC operation for 50/60 Hz. Please inquire about other voltages.
[2] The varistor is already integrated into the AC/DC contactors.
[3] Surge suppressors 3RT2936-1B/1E (version E03) can be used in 3RT2.4 contactors.

Selection and ordering data

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	SD d	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Surge suppressors without LED								
Sizes S6 to S12								
 3RT1956-1C.00	**For connecting to withdrawable coil for contactors with • Standard operating mechanisms 3RT1...-.A... • Solid-state operating mechanisms 3RT1...-.N...**				**Screw terminals**			
3RT1.5 ... 3RT1.7	**RC elements** 	24 ... 48	24 ... 70	▶	**3RT1956-1CB00**		1	1 unit
		48 ... 127	70 ... 150	▶	**3RT1956-1CC00**		1	1 unit
		127 ... 240	150 ... 250	▶	**3RT1956-1CD00**		1	1 unit
		240 ... 400	--	▶	**3RT1956-1CE00**		1	1 unit
		400 ... 600		20	**3RT1956-1CF00**		1	1 unit
 3RT1956-1C.02					**Spring-loaded terminals**			
3RT1.5 ... 3RT1.7	**RC elements** 	24 ... 48	24 ... 70	▶	**3RT1956-1CB02**		1	1 unit
		48 ... 127	70 ... 150	2	**3RT1956-1CC02**		1	1 unit
		127 ... 240	150 ... 250	▶	**3RT1956-1CD02**		1	1 unit
		240 ... 400	--	2	**3RT1956-1CE02**		1	1 unit
		400 ... 600		20	**3RT1956-1CF02**		1	1 unit

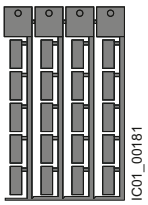
[1] Can be used for AC operation for 50/60 Hz. Other voltages on request.

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	mW	Order No.	Weight approx. kg
Surge suppressors with LED (also for spring-type terminals)						
3RT2916-1J.00 	***Size S00*** **For plugging onto the front side of the contactors (with and without auxiliary switch block)**					
3RT2.1, 3RH2.	**Varistor**	24 ... 48	12 ... 24	10 ... 120	**3RT2916-1JJ00**	0.010
		48 ...127	24 ... 70	20 ... 470	**3RT2916-1JK00**	0.010
		127 ... 240	70 ... 150	50 ... 700	**3RT2916-1JL00**	0.010
		—	150 ... 250	160 ... 950	**3RT2916-1JP00**	0.010
3RT2.1, 3RH2.	**Noise suppression diode**	—	24 ... 70	20 ... 470	**3RT2916-1LM00**	0.010
		—	50 ... 150	50 ... 700	**3RT2916-1LN00**	0.010
		—	150 ... 250	160 ... 950	**3RT2916-1LP00**	0.010
3RT2926-1MR00 	***Size S0*** **For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)**					
3RT2.2	**Varistor**	24 ... 48	12 ... 24	10 ... 120	**3RT2926-1JJ00**	0.010
		48 ...127	24 ... 70	20 ... 470	**3RT2926-1JK00**	0.010
		127 ... 240	70 ... 150	50 ... 700	**3RT2926-1JL00**	0.010
3RT2.2	**Diode assembly**	—	24	20 ... 470	**3RT2926-1MR00**	0.010
3RT2936-1J.00 	***Size S2 and S3*** **For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)**					
3RT2.3, 3RT2.4	**Varistor** [2]	24 ... 48	12 ... 24	10 ... 120	**3RT2936-1JJ00**	0.010
		48 ...127	24 ... 70	20 ... 470	**3RT2936-1JK00**	0.010
		127 ... 240	70 ... 150	50 ... 700	**3RT2936-1JL00**	0.010

1) Can be used for AC operations for 50/60 Hz. Other voltages on request.

2. 3RT2936 (version E03) surge suppressors can be used for 3RT2.4 contactors.

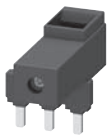
Selection and ordering data

	For contactors	Version	Units	Order No.	Weight approx. kg
Main conducting path surge suppression module for 3RT12 vacuum contactors					
	Sizes S10 and S12 3RT12	For damping overvoltages and protecting the motor windings against multiple reignition when switching off three-phase motors. For connection on the contactor feeder side (2-T1/4-T2/6-T3). For separate installation. Rated operational voltage U_e ≥ 500 V AC ... ≤ 690 V AC		**3RT1966-1PV3**	0.18
		Rated operational voltage U_e ≤ 1000 V AC		**3RT1966-1PV4**	0.36
Auxiliary conductor terminal, 3-pole					
3RT2946-4F 	***Size S3*** 3RT204.	For connecting auxiliary and control leads to the main conductor terminals (for one side).		**3RT2946-4F**	
Blank Labels					
3RT29 00- 1SB20 		Unit labeling plates 20 mm x 7 mm, pastel PC labeling system for individual inscription of unitlabeling plates available from: murrplastik Systems, Inc.	340 units	**3RT2900-1SB20**	0.200
		10 mm x 7 mm	816 units	**3RT2900-1SB10**	0.294

Links for paralleling


3RT1916-4BB31


3RT1916-4BB41


3RT1936-4BB31


3RT1956-4BA31

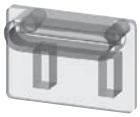
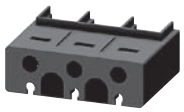
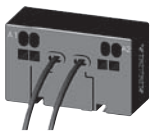
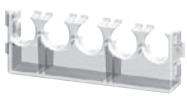
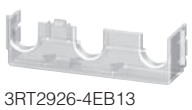
Size	For contactors Type	Maximum resistive current Ie/AC-1 (at 60 °C) of contactors A	Max. conductor cross sections	**Screw Terminals** Order No.	Standard package quantity	Weight approx. kg
S00	3RT201.	3-pole, with terminal 1), 2)	4 AWG, stranded	**3RT1916-4BB31**		0.015
S0	3RT202.		0 AWG, stranded	**3RT2926-4BB31**		0.042
S2	3RT203.		95 mm2	**3RT1936-4BB31**		0.139
S3	3RT204.	3-pole, with through hole (WYE jumpers) 1), 2)	185 mm2	**3RT1946-4BB31**		0.205
S6	3RT1. 5		—	**3RT1956-4BA31**		0.159
S10/S12	3RT1. 6 3RT1. 7		—	**3RT1966-4BA31**		0.541
S00	3RT231. 3RT251.	4-pole, with terminal 1), 2)	4 AWG, stranded	**3RT1916-4BB41**		0.016

1) Can be used for AC operation for 50/60 Hz.
Please inquire about further voltages.

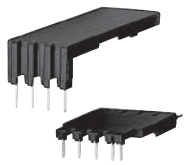
Selection and ordering data

	For contactors Type	Version	Order No.	Weight
EMC suppression modules; 3-phase, up to 10 HP				
	Size S00 (for contactors with AC or DC operation)			
			Screw terminals	
 3RT2916-1PA.	3RT201	**RC elements** (3 x 220 Ω/0.22 µF)		
		Up to 400 V	**3RT2916-1PA1**	
		Up to 575 V	**3RT2916-1PA2**	
		Up to 690 V	**3RT2916-1PA3**	
	3RT201	**Varistors**		
		Up to 400 V	**3RT2916-1PB1**	
		Up to 575 V	**3RT2916-1PB2**	
		Up to 690 V	**3RT2916-1PB3**	
Coupling links for control by PLC				
	Size S0			
 3RH2924-1GP11	3RT2. 2	**For mounting onto the coil terminals of the contactors (only for contactors with screw terminals)** With LED for indicating switching state. With integrated varistor for damping opening surges. 24 V DC control, 17 ... 30 V DC operating range	**3RH2924-1GP11**	
	Sizes S00 to S3			
 3RH2914-1GP11	3RT2. 1, 3RT2. 2, 3RT2. 3	**For mounting on the front side of contactors with AC, DC or AC/DC operation** 24 V DC control, 17 ... 30 V DC operating range	**3RH2914-1GP11**	
			Spring-type terminals	
		24 V DC control, 17 ... 30 V DC operating range	**3RH2914-2GP11**	
Additional load modules				
	Size S00			
 3RT2916-1GA00	3RT2. 1, 3RH2.	**For plugging onto the front side of the contactors with or without auxiliary switch blocks** For increasing the permissible residual current and for limiting the residual voltage. It ensures the safe opening of contactors with direct control via 230 V AC semiconductor outputs of SIMATIC controllers. It acts simultaneously as a surge suppressor. Rated voltage: 50/60 Hz, 180 to 255 V AC	**3RT2916-1GA00**	
LED module for indicating contactor operation				
	Sizes S00 to S3			
 3RT2926-1QT00	3RT2..	**For snapping into the location hole of an inscription label on the front of a contactor** either directly on the contactor or on the front auxiliary switch. The LED module is connected to coil terminals A1 and A2 of the contactor and indicates its energized state. Yellow LED. Rated voltage: 24 ... 240 V AC/DC, with reverse polarity protection.	**3RT2926-1QT00**	
Control kit				
	Sizes S00 to S3			
 3RT2916-4MC00		**For manual operation of the contactor contacts** for start-up and service		
	3RT2. 1, 3RH2.		**3RT2916-4MC00**	
	3RT2. 2		**3RT2926-4MC00**	
	3RT2. 3		**3RT2936-4MC00**	

Selection and ordering data

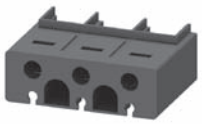
	For contactors Type	Version	Order No.	Weight
Sealable covers				
	Sizes S00 to S3			
 3RT2916-4MA10	3RT2.1, 3RT2.2, 3RT2.3, 3RT2.4, 3RH2.[1]	Sealable covers for preventing manual operation (Not suitable for coupling relays)	**3RT2916-4MA10**	
Connection modules for contactors with screw terminals				
	Sizes S00 and S0			
 3RT1926-4RD01		**Adapters for contactors** Ambient temperature $T_{u\,max}$ = 60 °C	**Screw terminals**	
	3RT2.1, 3RH2.	Size S00, rated operational current I_e at AC-3/400 V: 20 A	**3RT1916-4RD01**	
	3RT2.2	Size S0, rated operational current I_e at AC-3/400 V: 25 A	**3RT1926-4RD01**	
 3RT1900-4RE01	3RT2.1, 3RT2.2, 3RH2.	**Plugs for contactors** Size S00, S0	**3RT1900-4RE01**	
Terminal covers for contactors with box terminals				
	Size S2			
 3RT2936-4EA2		**Covers for box terminals**		
	3RT203	For 3-pole contactors	**3RT2936-4EA2**	
	3RT233, 3RT253	For 4-pole contactors (see Chapter 4)	**3RT2936-4EA4**	
Coil connection modules				
	Sizes S0 and S2			
 3RT2926-4RA11	3RT2.2, 3RT2.3	Connection from top Connection from below Connection diagonally	**3RT2926-4RA11** **3RT2926-4RB11** **3RT2926-4RC11**	
			Spring-type terminals	
 3RT2926-4RA12	3RT2.2	Connection from top Connection from below	**3RT2926-4RA12** **3RT2926-4RB12**	
Covers for contactors with ring cable lug connections				
	Size S00			
			Ring terminal lug connections	
 3RT2916-4EA13	3RT2.1, 3RH2	**Covers for ring terminal lug connections** Single covers	**3RT2916-4EA13**	
	Size S0			
 3RT2926-4EB13	3RT2.2	**Covers for ring terminal lug connections** Set for one device, comprising 4 single covers: - 2 x 3RT2926-4EB13 - 2 x 3RV2928-4AA00	**3RT2926-4EB13**	

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

	For contactors Type	Version	Order No.	Weight
Screw adapters for fixing the contactors				
	Sizes S0 and S2			
 NSB0_01470 3RT1926-4P	3RT2.2, 3RT2.3	Screw adapters for easier screw fixing 2 units required per contactor (1 pack contains 10 sets for 10 contactors)	**3RT1926-4P**	
Solder pin adapters for contactors up to 7.5 HP / 12 A				
	Size S00, up to 7.5 HP			
			Screw terminals	
	3RT2.1, 3RH21	Assembly kit for soldering contactors onto a printed circuit board. For 1 contactor, 1 set is required.	**3RT1916-4KA1**	
 3RT1916-4KA1				
Solder pin adapters for contactors up to 7.5 HP / 12 A with mounted 4-pole auxiliary switch block				
	Size S00, up to 7.5 HP			
   3RT1916-4KA2	3RT2.1, 3RH21	Assembly kit for soldering contactors with an auxiliary switch block onto a printed circuit board. For 1 contactor, 1 set is required.	**3RA1916-4KA2**	
Safety main current connectors for 2 contactors				
	Sizes S00 to S2			
 3RA2926-1A	3RT2.1 3RT2.2 3RT2.3	**For series connection of 2 contactors**	**3RA2916-1A** **3RA2926-1A** **3RA2936-1A**	

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

Selection and ordering data

	For contactors Size	Type	Design	Order No.	Weight approx. kg.
Box terminal block for contactors with screw connections					
3RT19 5. -4G 			For circular conductors and ribbon cables For connectable cross-sections, see technical data of contactors, page 2/99		
	S3	3RT2. 4	16 mm² / 10 AWG (solid), 70 mm² / 0 AWG (stranded)	**3RT19 46-4G**	
	S6	3RT1. 5 (3RB205)	up to 70 mm² / 2/0 AWG up to 120 mm² / 4/0 AWG	**3RT19 55-4G** **3RT19 56-4G**	0.23 0.26
	S10, S12	3RT1. 6, 3RT1. 7 (3RB206)	240 mm² - 500 mm² / 500 MCM - 750 MCM with auxiliary conductor connection	**3RT19 66-4G**	0.64
Covers for contactors with screw connections					
3RT29 36-4EA2 			**Terminal cover for box terminals**		
	S2	3RT20 3	Additional shock-hazard protection for mounting on the box terminals (2 units required per contactor)	**3RT29 36-4EA2**	0.012
	S3	3RT20 4		**3RT19 46-4EA2**	
	S6	3RT1. 5	Length: 25 mm	**3RT19 56-4EA2**	0.016
	S10, S12	3RT1. 6, 3RT1. 7	Length: 30 mm	**3RT19 66-4EA2**	
			Terminal cover for cable lug and busbar connection		
3RT19 46-4EA1 	**S3**	3RT20 4 3RT24 4	For complying with the phase clearances and as shock-hazard protection in the case of a distant box terminal [1] (2 units required per contactor)	**3RT19 46-4EA1**	0.028
	S6	3RT1. 5	Length: 100 mm	**3RT19 56-4EA1**	0.05
	S10, S12	3RT1. 6, 3RT1. 7	Length: 120 mm	**3RT19 66-4EA1**	
			For covering bars between the contactor and 3RB20 overload relay or wiring connector for contactor assemblies		
	S6	3RT1. 5	Length: 27 mm	**3RT19 56-4EA3**	0.018
	S10, S12	3RT1. 6, 3RT1. 7	Length: 42 mm	**3RT19 66-4EA3**	

	Design	Order No.	Package quantity	Weight approx. kg
Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm² (17 AWG)				
3RT1916-4JA02 	Insulation stop strips can be inserted in cable entry of the spring terminal (2 strips per contactor required)			
	• For basic devices S00 (3RT201. or 3RH2.), removable individually	**3RT2916-4JA02**	20 strips	0.005
	• For auxiliary and control circuit on basic devices size S0 and S2 (3RT2.2., 3RT2.3.) and for mountable 3RH29 auxiliary switches, removable in pairs	**3RT1916-4JA02**	20 strips	0.010
Tool for opening spring-type terminals				
3RA2908-1A 	**Screwdriver** for all SIRIUS devices with spring-type terminals Length: approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray//black, partially insulated	**3RA2908-1A**	1 unit	0.045

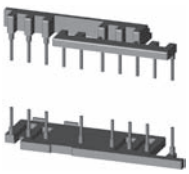
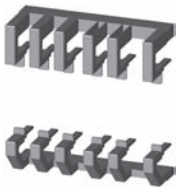
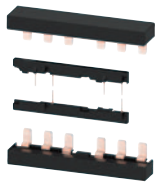
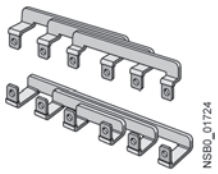
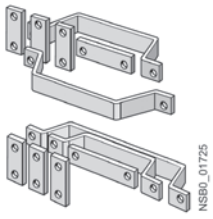
1) Refer to the note on page 2/144, conductor cross-sections.

Accessories

	For contactors Type	Size	Design	Order No.	Weight approx. kg
Mechanical interlocks					
3RA19 24-2B 	3RT2.3	**S2**	**laterally mountable** for 3RT2 S2 contactors only. There are no NC auxiliary contacts. Use the integrated NC auxiliary on the contactor.	**3RA2934-2B**	0.04
	3RT204, 3RT234, 3RT245	**S3** [1]	**laterally mountable** each with one auxiliary contact (1 NC) per contactor (can only couple contactors of max. 1 level different size. The mounting depth of the smaller contactor has to be adapted.) Interlock width: 10 mm	**3RA2934-2B**	0.05
3RA19 54-2G 	3RT204 to 3RT105	**S3 to S6**	**adapter to mechanically** interlock a 3RT204 with a 3RT105 includes the adapter and QTY 2 - 3RA1942-2G mechanical connectors requires the 3RA1954 - 2A to be ordered separately Note: Fits 3RT104 AC coil versions only. Does not fit 3RT104 DC coil versions.	**3RA1954-2G**	
3RA19 54-2A 	3RT1. 5 to 3RT1. 7	**S6, S10, S12**	**laterally mountable** without auxiliary contacts; size S6, S10 and S12 contactors can be interlocked with each other as required; no adaptation of mounting depth is necessary. Contactor clearance 10 mm.	**3RA1954-2A**	0.02
Baseplates				1 unit	
3RA1972-2A 	3RT10 5	**S6**	for customer mounting of contactor assemblies for reversing	**3RA1952-2A**	1.3
	3RT1. 6	**S10**		**3RA1962-2A**	2.4
	3RT1. 7	**S12**		**3RA1972-2A**	2.6

1) Can also be used for size S3 4-pole contactors.

Accessories

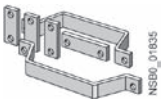
	For contactors Type	Size	Details	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
Assembly kits for making 3-pole contactor assemblies						
3RA2913-2AA1 	3RT201	**S00**	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • For main, auxiliary and control circuits	**3RA2913-2AA1**	**3RA2913-2AA2**	1 kit
3RA2923-2AA2 	3RT202	**S0**	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • For main, auxiliary and control circuits [1] • Only for main circuit [2]	**3RA2923-2AA1** —	— **3RA2923-2AA2**	1 kit 1 kit
3RA2933-2AA1 	3RT203	**S2**	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • Only for main circuit [3]	**3RA2933-2AA1** —	— **3RA2933-2AA2**	1 kit 1 kit
3RA2943-2AA1 	3RT204	**S3**	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom and the mechanical interlock	**3RA2943-2AA1**	—	
3RA19 53-2A 	3RT105	**S6**	The installation kit contains: Wiring modules on the top and bottom (for connection with box terminal)	**3RA19 53-2A**	—	1 kit
	3RT105 3RT1. 6 3RT1. 7	**S6** **S10** **S12**	The installation kit contains: Wiring modules on the top and bottom (for connection without box terminals)	**3RA1953-2M** **3RA1963-2A** **3RA1973-2A**		1 kit

1) Use of the 3RA2923-2AA1 assembly kit in conjunction with the 3RT202.-.....-3MA0 contactors is limited because the auxiliary switches in the basic unit are not allowed to be used on account of the permanently mounted auxiliary switch block.

2) Version in size S0 with spring-type terminals: Only the wiring modules for the main circuit are included. No connectors are included for the auxiliary and control circuit.

3) Version in size S2 with spring-type terminals in the auxiliary and control circuits: Only the wiring modules for the main circuit are included. A cable set is included for the auxiliary circuit.

Accessories

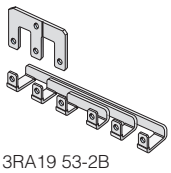
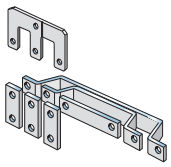
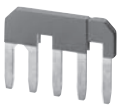
	For contactors Type	Size	Contactor gap for interlock	Version	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
Wiring modules							
3RA2913-3DA1 	3RT201	**S00-S00**	0 mm	Top (in-phase) Bottom (phase reversal)	**3RA2913-3DA1** **3RA2913-3EA1**	**3RA2913-3DA2** **3RA2913-3EA2**	1 1
	3RT202	**S0-S0**	0 mm	Top (in-phase) Bottom (phase reversal)	**3RA2923-3DA1** **3RA2923-3EA1**	**3RA2923-3DA2** **3RA2923-3EA2**	1 1
3RA2913-3EA1 	3RT203	**S2-S2**	10 mm	Top (in-phase) Bottom (phase reversal)	**3RA1933-3D** **3RA1933-3E**	**3RA1933-3D** **3RA1933-3E**	1 1
	3RT204	**S3-S3**	10 mm	Top (in-phase) Bottom (phase reversal)	**3RA1943-3D** **3RA1943-3E**	**3RA1943-3D** **3RA1943-3E**	1 1
3RA1953-3D 	3RT105	**S6-S6**	10 mm	Top (in-phase, for connection with box terminal)	**3RA1953-3D**	**3RA1953-3D**	1
3RA1953-3P 				Top (with phase reversal, for connection without box terminal)	**3RA1953-3P**	**3RA1953-3P**	1

	For contactors Type	Size	Contactor gap for interlock	Interlock Type	Version	Order No.	Pkg. qty.
Mechanical connectors[1]							
3RA29. 2-2H 	3RT201	**S00-S00**	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	**3RA2912-2H**	1 set
	3RT202	**S0-S0**	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	**3RA2922-2H**	1 set
3RA2932-2C 	3RT203	**S2-S2**	0 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2C**	5 sets
			10 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2D**	5 sets
3RA2932-2D 	3RT233			Laterally mountable	For 4-pole contactors	**3RA2932-2G**	5 sets
	3RT2. 4	**S3-S3**	0 mm	Mountable on front	For 3-pole contactors	**3RA2932-2C**	10 sets
3RA2932-2G 			10 mm	Laterally mountable	For 3-pole contactors	**3RA2932-2D**	10 sets
					For 4-pole contactors	**3RA2942-2G**	10 sets
3RA1942-2G 	3RT1. 5	**S6-S6**	10 mm	Laterally mountable	Top (with phase reversal, for connection without box terminal)	**3RA1932-2D**	10 sets

Note: Standard package quantities may change. Check Industry Mall for current package quantities.

1) 1 set for 1 contactor. Size S00 & S0: 1 set includes 2 connectors and 1 interlock. **Size S2: The mechanical interlock must be ordered separately.** S3-S6: 1 set includes 2 connectors; one connector for top and one connector for bottom.

Accessories

	Design	Sizes	Order No.		Weight approx. kg
Installation kits[1) 2)]					
 3RA19 53-2B	The installation kit contains: Mechanical interlock, 4 connecting clips, WYE jumper, Wiring connectors on the top and bottom,- For main, auxiliary, and control circuits[3)]	**S00-S00-S00**	**3RA2913-2BB1**	1 set	0.05
	The installation kit contains: mechanical interlock, 4 connecting clips, WYE jumper, wiring connectors on the top and bottom - For main, auxiliary, and control circuits[3)]	**S0-S0-S0**	**3RA2923-2BB1**	1 set	0.10
		S2-S2-S0	**3RA2933-2C**	1 set	0.16
		S2-S2-S2	**3RA2933-2BB1**		0.16
 3RA19 53-2N, 3RA19 63-2B, 3RA19 73-2B	The installation kit contains: WYE jumper on the top Wiring jumper on the bottom (The wiring connector on the top is not included in the scope of supply. A double infeed between the line contactor and the delta contactor is recommended.)	**S3-S3-S2**	**3RA2943-2C**		0.33
		S3-S3-S3	**3RA2943-2BB1**		0.16
		S6-S6-S6	**3RA1953-2B**		0.85
		S6-S6-S6	**3RA1953-2N**		0.60
		S10-S10-S10	**3RA1963-2B**		1.80
		S12-S12-S12	**3RA1973-2B**		2.20
3-phase feeder terminal					
	Feeder terminal block for the line contactor for large conductor cross-sections			1 unit	
	Conductor cross-section: 6 mm², 10 AWG	**S00**	**3RA2913-3K**		0.02
	Conductor cross-section: 16 mm², 6 AWG	**S0**	**3RV2925-5AB**		0.04
	Conductor cross-section: 70 mm², 2/0 AWG	**S2**	**3RV2935-5A**		0.10
1-phase feeder terminals					
	Conductor cross-section: 95 mm²	**S3**	**3RA2943-3L**		0.280
3-phase busbar					
	For in-phase bridging of all input terminals of the line contactor (K1)	**S0**	**3RV1915-1AB**	1 unit	0.03
	and the delta contactor (K3)	**S2**	**3RV2935-5E**		0.15
Link for paralleling, 3-pole (WYE jumpers)					
3RT19 26-4BA31 	Without terminal (the links for paralleling can be reduced by one pole)	**S00**[1)]	**3RT1916-4BA31**	1 unit	0.010
		S0[1)]	**3RT1926-4BA31**		0.020
		S2	**3RT1936-4BA31**		0.02
		S3	**3RT1946-4BA31**		0.02
		S6[4)]	**3RT1956-4BA31**		0.15
		S10, S12[4)]	**3RT1966-4BA31**		
Baseplates					
	For customer assembly of WYE-delta contactor assemblies with a **laterally mounted** time-delay			1 unit	
	Side-by-side mounting	**S2 S2 S0**	**3RA2932-2F**		0.45
	10 mm clearance between K3 and K2	**S2 S2 S2**	**3RA2932-2F**		0.48
	Side-by-side mounting	**S3 S3 S2**	**3RA2942-2F**		0.72
	Side-by-side mounting	**S3 S3 S3**	**3RA2942-2F**		0.72
	10 mm clearance between K1, K3 and K2	**S6 S6 S3**	**3RA1952-2E**	1 unit	2.0
		S6 S6 S6	**3RA1952-2F**		2.1
		S10 S10 S6	**3RA1962-2E**		
		S10 S10 S10	**3RA1962-2F**		
		S12 S12 S10	**3RA1972-2E**		
		S12 S12 S12	**3RA1972-2F**		

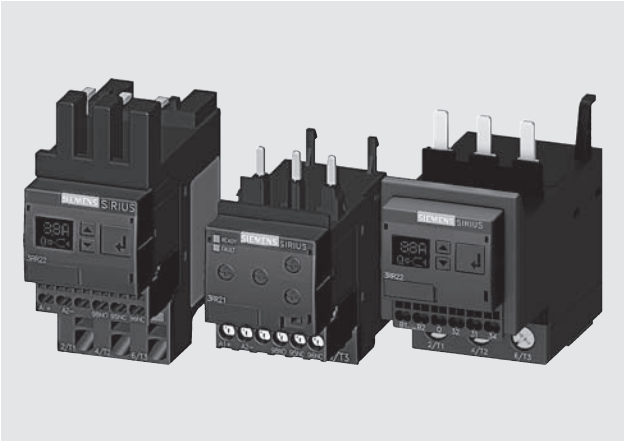
1) Size S00, S0 and S2 installation kits for paralleling are available in spring-type terminals. Change the last digit of the order number to a "2".

2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required. See page 2/47 for more information.

3) Also requires quantity (1) 3RA2816-0EW20 function module set for all control functions. See page 2/47.

4) The 3RT19 56-4EA1 (S6) or 3RT19 66-4EA1 (S10, S12) cover can be used for shock-hazard protection.

Overview



SIRIUS 3RR2242, 3RR2142 and 3RR2243 current monitoring relays

The SIRIUS 3RR2 current monitoring relays are suitable for the load monitoring of motors or other loads. In two or three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR2 current monitoring relays can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

Versions

Basic versions

The basic versions with two-phase apparent current monitoring, a CO contact output and analog adjustability provide a high level of monitoring reliability especially in the rated and overload range.

Standard versions

The standard versions monitor the current in three phases with selectable active current monitoring. They have additional diagnostics options such as residual current monitoring and phase sequence monitoring, and they are also suitable for monitoring motors below the rated torque. These devices have an additional independent semiconductor output, an actual value indicator, and are digitally adjustable.

Both versions are available optionally with screw or spring-type terminals, in each case for sizes S00 and S0. With variants of size S2 the main current paths always have screw terminals; the control current side can have screw or spring-type terminals.

Note:

In addition to the features of the standard versions, 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link also offer the possibility of transmitting the measured values and diagnostics data to a controller via an IO-Link. Furthermore, the devices can be parameterized on the devices themselves or via IO-Link.

Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw terminals or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for broken cables, phase failure, phase sequence, residual current and motor blocking

Application

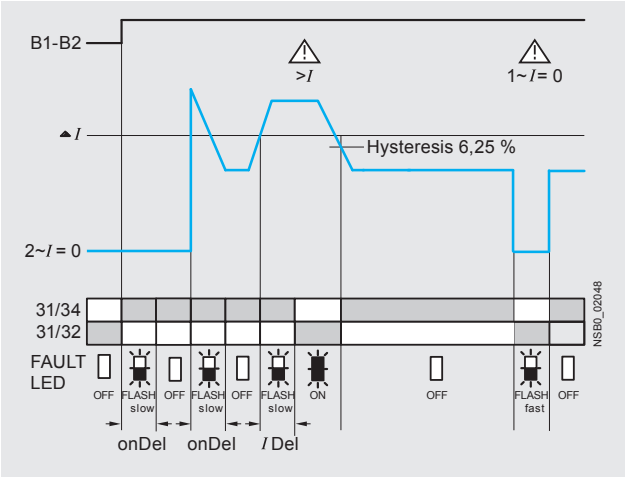
- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on conveyor belts or cranes due to an excessive load
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

Technical specifications

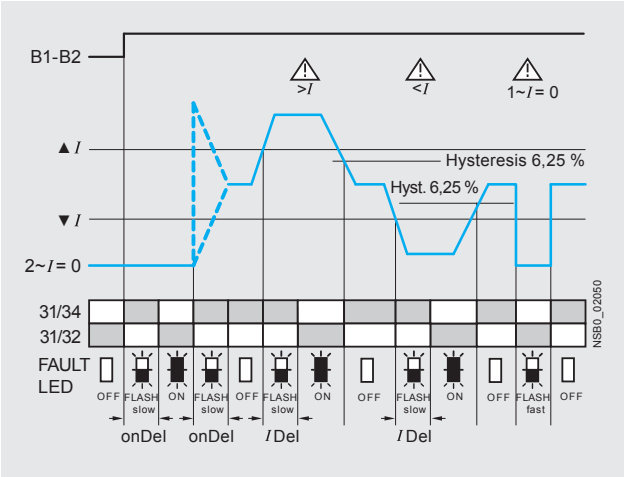
Function charts of 3RR214.-.A.30 basic variants, analog dial adjustable

Closed-circuit principle upon application of the control supply voltage

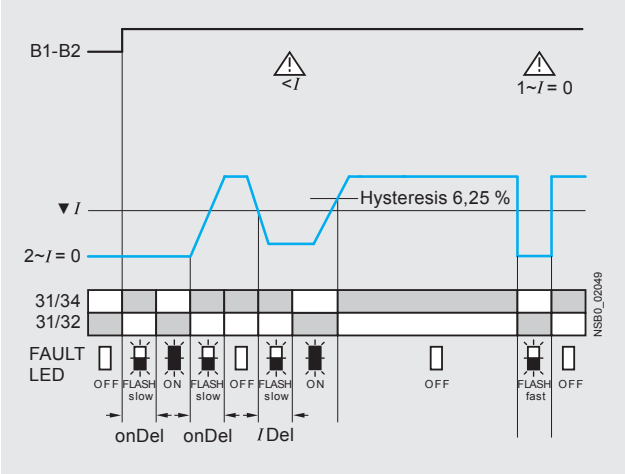
Current overshoot



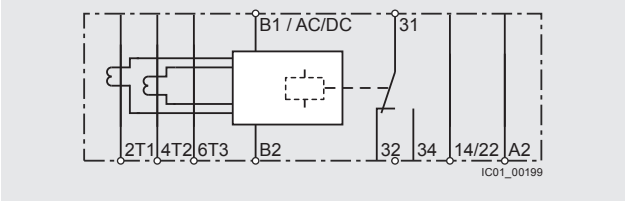
Range monitoring



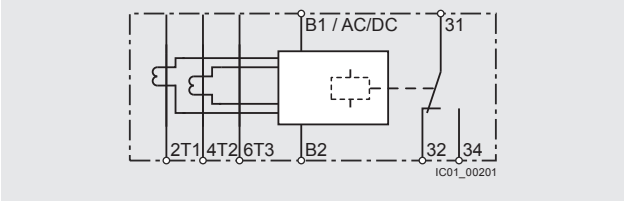
Current undershoot



Circuit diagrams



3RR2141-1A.30



3RR2141-2A.30, 3RR2142-.A.30, 3RR2143-.A.30

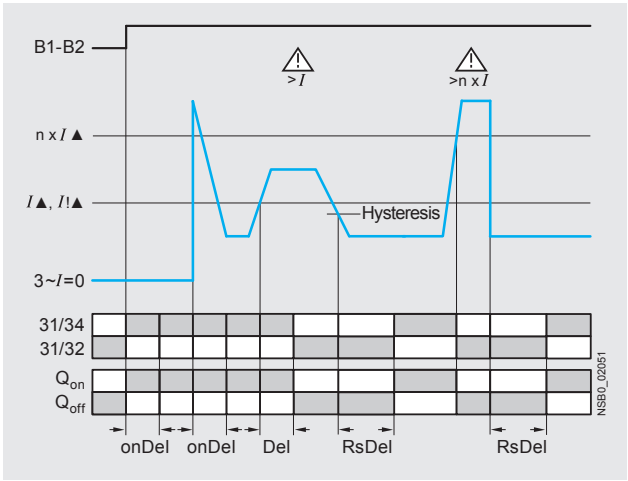
Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

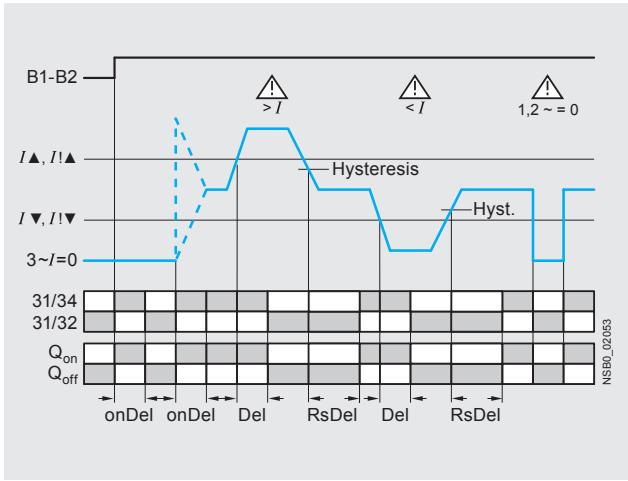
Function charts of 3RR224.-.F.30 standard versions, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

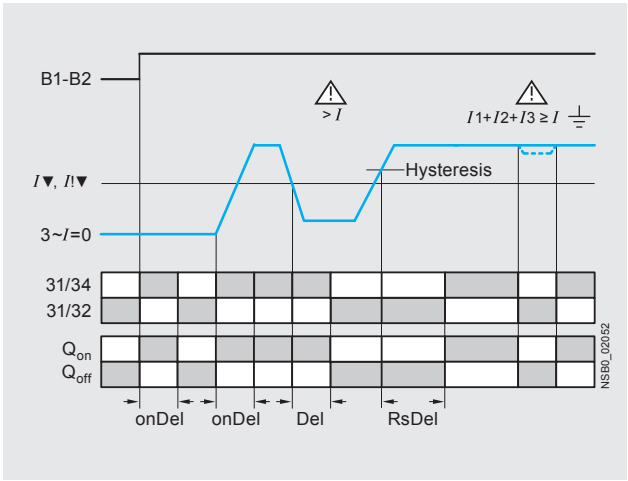
Current overshoot



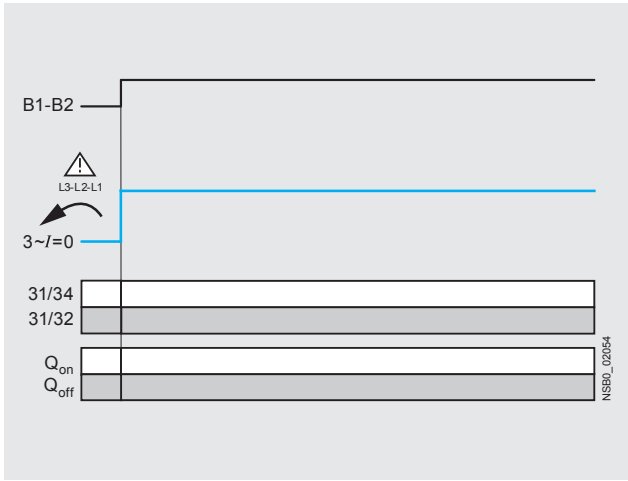
Range monitoring



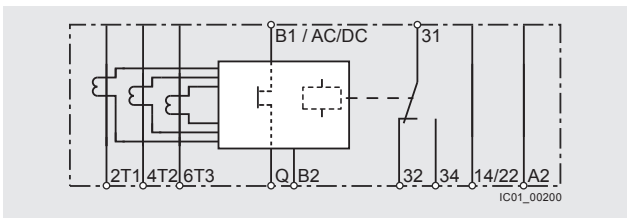
Current undershoot with residual current monitoring



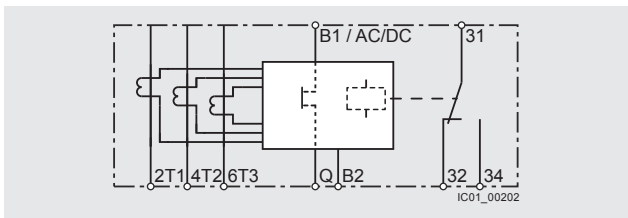
Phase sequence monitoring



Circuit diagrams



3RR2241-1F.30



3RR2241-2F.30, 3RR2242-.F.30, 3RR2243-.F.30

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Selection and ordering data

SIRIUS 3RR21/3RR22 current monitoring relays

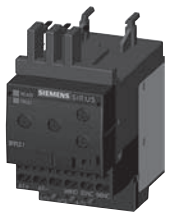
- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 30 s
- Auto or Manual RESET


3RR2141-1AW30


3RR2142-1AW30


3RR2241-1FW30

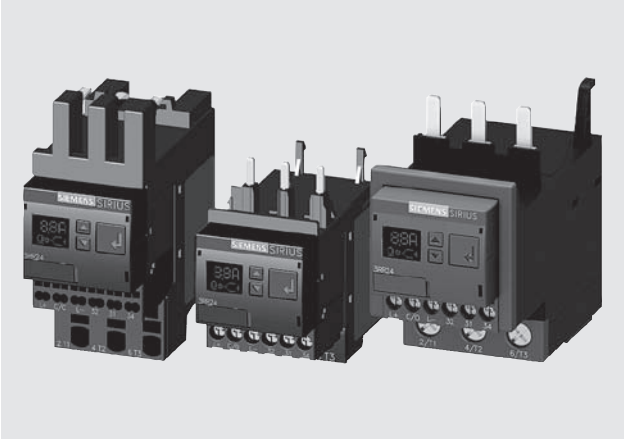

3RR2242-1FW30


3RR2141-2AA30


3RR2243-3FW30

Size	Measuring range	Hysteresis	Control supply voltage U_s	Screw terminals	Spring-type terminals
	A	A	V	Order No.	Order No.
Basic versions					
• Analogically adjustable • Closed-circuit principle • 1 CO contact • 2-phase current monitoring • Apparent current monitoring • Start-up delay 0 ... 60 s					
S00	1.6 ... 16	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2141-1AA30** **3RR2141-1AW30**	**3RR2141-2AA30** **3RR2141-2AW30**
S0	4 ... 40	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2142-1AA30** **3RR2142-1AW30**	**3RR2142-2AA30** **3RR2142-2AW30**
S2	8 ... 80	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	**3RR2143-1AA30** **3RR2143-1AW30**	**3RR2143-3AA30** **3RR2143-3AW30**
Standard versions					
• Digitally adjustable • LC display • Open or closed-circuit principle • 1 CO contact • 1 semiconductor output • 3-phase current monitoring • Active current or apparent current monitoring • Phase sequence monitoring • Residual current monitoring • Blocking current monitoring • Reclosing delay time 0 ... 300 min • Start-up delay 0 ... 99 s • Separate settings for warning and alarm thresholds					
S00	1.6 ... 16	0.1 ... 3	24 AC/DC 24 ... 240 AC/DC	**3RR2241-1FA30** **3RR2241-1FW30**	**3RR2241-2FA30** **3RR2241-2FW30**
S0	4 ... 40	0.1 ... 8	24 AC/DC 24 ... 240 AC/DC	**3RR2242-1FA30** **3RR2242-1FW30**	**3RR2242-2FA30** **3RR2242-2FW30**
S2	8 ... 80	0.2 ... 16	24 AC/DC 24 ... 240 AC/DC	**3RR2243-1FA30** **3RR2243-1FW30**	**3RR2243-3FA30** **3RR2243-3FW30**

Overview



SIRIUS 3RR2441, 3RR2442 and 3RR2443 current monitoring relays

The SIRIUS 3RR24 current monitoring relays for IO-Link are suitable for the load monitoring of motors or other loads. In three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option, which is also selectable, can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR24 current monitoring relays for IO-Link can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

The SIRIUS 3RR24 current monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the conventional SIRIUS 3RR2 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization
- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission by upload to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V 1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start up after voltage failure and to make sure diagnostics data is not lost
- By integration into the automation level the option exists of parameterizing the monitoring relay at any time via a display unit or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present
- If the monitoring relays are operated without the controller, the 3RR24 monitoring relays for IO-Link have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring outlay – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

For further information on the IO-Link communication system, see Chapter 14.

Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for current unbalance, broken cables, phase failure, phase sequence, residual current and motor blocking
- Integrated counter for operating cycles and operating hours to support requirements-based maintenance of the monitored machine or application
- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

Application

- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on pumps due to a dirty filter system
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plant in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

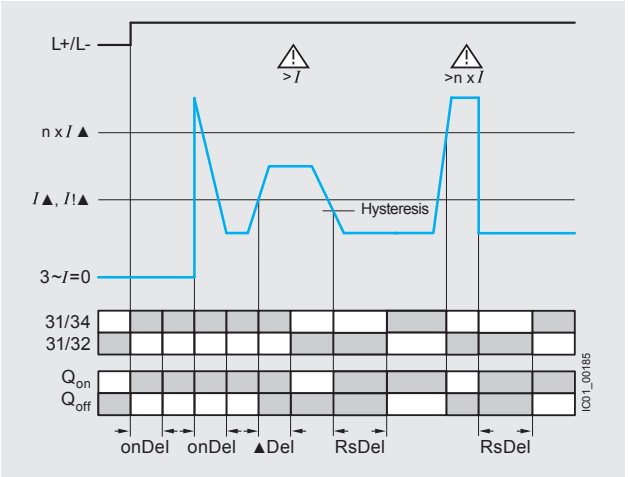
The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

Technical specifications

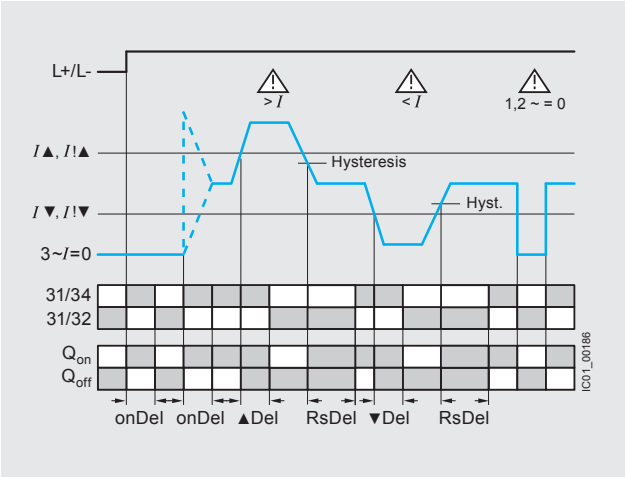
Function charts of 3RR24 for IO-Link, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

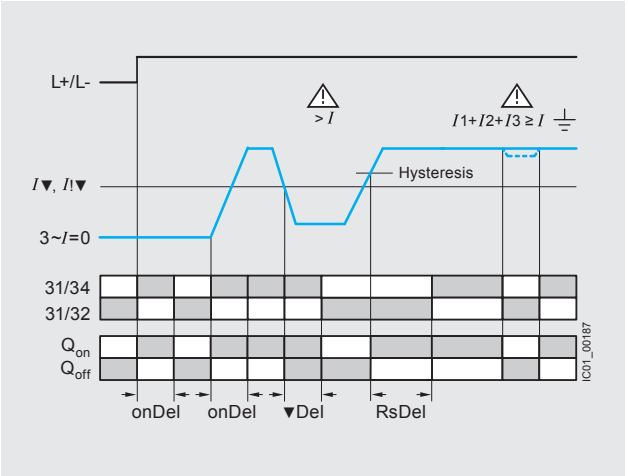
Current overshoot



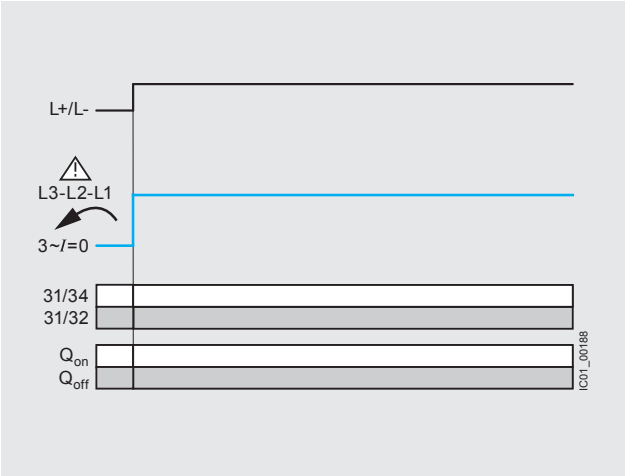
Range monitoring



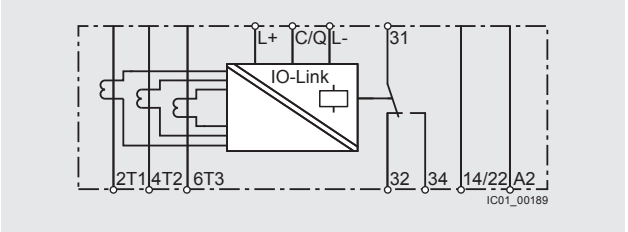
Current undershoot with residual current monitoring



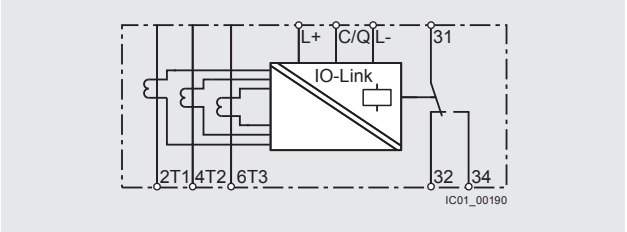
Phase sequence monitoring



Circuit diagrams



3RR2441-1AA40



3RR2441-2AA40, 3RR2442-.AA40, 3RR2443-.AA40

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Selection and ordering data

SIRIUS 3RR24 current monitoring relays for IO-Link

- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 999.9 s
- Auto or Manual RESET


3RR2441-1AA40


3RR2442-1AA40


3RR2441-2AA40

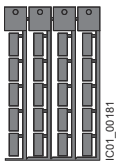

3RR2442-2AA40


3RR2443-1AA40


3RR2443-3AA40

Size	Measuring range	Hysteresis	Control supply voltage U_s	Screw terminals	Spring-type terminals
	A	A	V	Order No.	Order No.
• Digitally adjustable • LC display • Open or closed-circuit principle • 1 CO contact • 1 semiconductor output (in SIO mode) • 3-phase current monitoring • Active current or apparent current monitoring • Current unbalance monitoring • Phase sequence monitoring • Residual current monitoring • Blocking current monitoring • Operating hours counter • Operating cycles counter • Reclosing delay time 0 ... 300 min • Start-up delay 0 ... 999.9 s • Separate settings for warning and alarm thresholds					
S00	1.6 ... 16	0.1 ... 3	24 DC	**3RR2441-1AA40**	**3RR2441-2AA40**
S0	4 ... 40	0.1 ... 8	24 DC	**3RR2442-1AA40**	**3RR2442-2AA40**
S2	8 ... 80	0.2 ... 16	24 DC	**3RR2443-1AA40**	**3RR2443-3AA40**

Accessories

	Use	Version	Size	Order No.	Standard Pack Quantity
Terminal supports for stand-alone installation[1]					
 3RU2916-3AA01	For 3RR21, 3RR22, 3RR24	For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail according to IEC 60715		**Screw terminals**	
		• Screw connection	S00	**3RU2916-3AA01**	1 unit
			S0	**3RU2926-3AA01**	1 unit
			S2	**3RU2936-3AA01**	1 unit
 3RU2926-3AC01				**Spring-type terminals**	
		• Spring-type connection	S00	**3RU2916-3AC01**	1 unit
			S0	**3RU2926-3AC01**	1 unit
Blank labels					
 3RT2900-1SB20	For 3RR21, 3RR22, 3RR24	**Unit labeling plates**[2] For SIRIUS devices 20 mm x 7 mm, titanium gray		**3RT2900-1SB20**	340 units
Sealable covers					
 3RR2940	For 3RR21, 3RR22, 3RR24	**Sealable covers** For securing against unintentional or unauthorized adjustment of settings		**3RR2940**	5 units
	For 3RR21	**Sealing foil** For securing against unauthorized adjustment of setting knobs		**3TK2820-0AA00**	1 unit
Tools for opening spring-type terminals					
 3RA2908-1A	For auxiliary circuit connections	**Screwdrivers** For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		**Spring-type terminals** **3RA2908-1A**	1 unit

1) The accessories are identical to those of the 3RU21 thermal overload relays and the 3RB3 electronic overload relays, see Chapter 3 "Overload Relays".

2) PC labeling system for individual inscription of unit labeling plates available from: Systems, Inc. www.murrplastic.com

Selection and ordering data

*** NEMA Type 1 Enclosures**
*** Lift off cover**
*** Accepts SIRIUS power control components**
  *** Non-reversing contactors**
  *** Reversing contactors**
  *** Starters with thermal overload relays**
  *** Starters with solid-state overload relays**

Application

The 49EC14*B separate enclosures are designed for field assembly of a wide range of Siemens SIRIUS open style control components and field modification kits as listed in the charts below. Note that certain components require the addition of a DIN Rail kit for proper mounting in the enclosure.

NEMA 1 Enclosures

Max. current	Contactor		Max. current	Overload relay		Required DIN rail kit	NEMA 1 Enclosure
A	Non-reversing	Reversing	A	Thermal	Solid-state	Order No.	Order No.
16	3RT201	3RA231	16	3RU2116	3RB3016	**MTR5**	**49EC14EB110705R**
38	3RT202	3RA232	40	3RU2126	3RB3026	**MTR5**	
50	3RT203		50	3RU2136	3RB3036	—	**49EC14GB140807R**
12		3RA231	12	3RU2116	3RB3016	**MTR5**	
25		3RA232	25	3RU2126	3RB3036	**MTR5**	
50		3RA233	50	3RU2136	3RB3036	—	
95	3RT204		100	3RU2146	3RB3046	—	**49EC14IB201208R**
95		3RA234	100	3RU2146	3RB3046	—	

Accessories for NEMA 1 Enclosures

Accessory type	Description	Legends	Voltage	Order No.
Push buttons	Momentary	Start - Stop	none	**49SDPB5**
	Monentary	Reset (blue)		**49MBRS**
Selector Switch	2 position	Off - On	none	**49SDSB4**
	3 position	Hand - Off - Auto	none	**49SDSB1**
		For - Off - Rev		**49SDSB2**
		High - Off - Low		**49SDSB3**
Pilot light	Light module and lens color: RED, GREEN, and AMBER"	ON, RUN, OFF, OL TRIPPED	24 to 240 AC DC	**49SDLBU**
			277V AC	**49SDLBL**
	Light module and lens color: RED, RED	REV - FOR or HIGH - LOW	24 to 240 AC DC	**49SDLB7RU**
			277V AC	**49SDLB7RL**
	Light module and lens color: GREEN, GREEN	REV - FOR or HIGH - LOW	24 to 240 AC DC	**49SDLB7GU**
			277V AC	**49SDLB7GL**

For 3RT contactors, see page 2/8.
For 3RA reversing, see pages 2/39.
For thermal overloads, see page 3/10.
For solidstate overloads, see pages 3/22.
For enclosure dimensions, see figures 1, 2, and 3 on page 9/150.

Selection and ordering data

For screw, spring-type and ring lug terminal connection

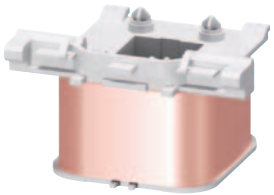
3RT29 24-5A.01

For contactors		Rated control supply voltage U_s			Order No.	Weight approx.
Size	Type	50 Hz	50/60 Hz	60 Hz		
		V	V	V		kg
Solenoid coils · AC operation						
S0	3RT20 23, 3RT20 24, 3RT20 25	24	--	--	**3RT29 24-5AB01**	0.100
		42	--	--	**3RT29 24-5AD01**	0.100
		48	--	--	**3RT29 24-5AH01**	0.100
		110	--	--	**3RT29 24-5AF01**	0.100
		230	--	--	**3RT29 24-5AP01**	0.100
		400	--	--	**3RT29 24-5AV01**	0.100
		--	24	--	**3RT29 24-5AC21**	0.100
		--	42	--	**3RT29 24-5AD21**	0.100
		--	48	--	**3RT29 24-5AH21**	0.100
		--	110	--	**3RT29 24-5AG21**	0.100
		--	220	--	**3RT29 24-5AN21**	0.100
		--	230	--	**3RT29 24-5AL21**	0.100
		110	--	120	**3RT29 24-5AK61**	0.100
		220	--	240	**3RT29 24-5AP61**	0.100
		--	100	110	**3RT29 24-5AG61**	0.100
		--	200	220	**3RT29 24-5AN61**	0.100
		--	400	440	**3RT29 24-5AR61**	0.100
S0	3RT20 26, 3RT20 27, 3RT20 28 3RT23 25, 3RT23 26, 3RT23 27 3RT25 26	24	--	--	**3RT29 26-5AB01**	0.100
		42	--	--	**3RT29 26-5AD01**	0.100
		48	--	--	**3RT29 26-5AH01**	0.100
		110	--	--	**3RT29 26-5AF01**	0.100
		230	--	--	**3RT29 26-5AP01**	0.100
		400	--	--	**3RT29 26-5AV01**	0.100
		--	24	--	**3RT29 26-5AC21**	0.100
		--	42	--	**3RT29 26-5AD21**	0.100
		--	48	--	**3RT29 26-5AH21**	0.100
		--	110	--	**3RT29 26-5AG21**	0.100
		--	208	--	**3RT29 26-5AM21**	0.100
		--	220	--	**3RT29 26-5AN21**	0.100
		--	230	--	**3RT29 26-5AL21**	0.100
		110	--	120	**3RT29 26-5AK61**	0.100
		220	--	240	**3RT29 26-5AP61**	0.100
		--	100	110	**3RT29 26-5AG61**	0.100
		--	200	220	**3RT29 26-5AN61**	0.100
		--	400	440	**3RT29 26-5AR61**	0.100
		500	--		**3RT29 26-5AQ21**	0.100
			277		**3RT29 26-5AU61**	0.100
			480		**3RT29 26-5AV61**	0.100
			600		**3RT29 26-5AT61**	0.100

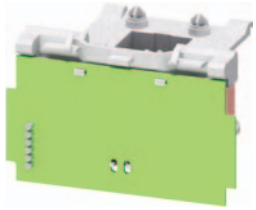
Note:

Contactors with AC and AC/DC coils have different depths. It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils. It is not possible to replace the coils on DC contactors in the S0 frame.

Screw terminals and spring-type terminals



3RT2934-5A.01



3RT2934-5N.31

For contactors	Rated control supply voltage U_s				SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	50 Hz	50/60 Hz	60 Hz	DC						
Type	V	V	V		d					
Solenoid coils · AC operation										
Size S2										
3RT203.-.A, 3RT233.-.A, 3RT253.-.A	24	--	--	--	5	**3RT2934-5AB01**		1	1 unit	41B
	42	--	--	--	5	**3RT2934-5AD01**		1	1 unit	41B
	48	--	--	--	5	**3RT2934-5AH01**		1	1 unit	41B
	110	--	--	--	5	**3RT2934-5AF01**		1	1 unit	41B
	230	--	--	--	5	**3RT2934-5AP01**		1	1 unit	41B
	400	--	--	--	5	**3RT2934-5AV01**		1	1 unit	41B
	--	24	--	--	5	**3RT2934-5AC21**		1	1 unit	41B
	--	42	--	--	5	**3RT2934-5AD21**		1	1 unit	41B
	--	48	--	--	5	**3RT2934-5AH21**		1	1 unit	41B
	--	110	--	--	5	**3RT2934-5AG21**		1	1 unit	41B
	--	220	--	--	5	**3RT2934-5AN21**		1	1 unit	41B
	--	230	--	--	5	**3RT2934-5AL21**		1	1 unit	41B
	110	--	120	--	5	**3RT2934-5AK61**		1	1 unit	41B
	220	--	240	--	5	**3RT2934-5AP61**		1	1 unit	41B
	--	--	480	--	5	**3RT2934-5AV61**		1	1 unit	41B
	--	--	600	--	5	**3RT2934-5AT61**		1	1 unit	41B
	--	100	110	--	5	**3RT2934-5AG61**		1	1 unit	41B
	--	200	220	--	5	**3RT2934-5AN61**		1	1 unit	41B
	--	400	440	--	5	**3RT2934-5AR61**		1	1 unit	41B
Size S3 NEW										
3RT2.4.-.A	24	--	--	--	X	**3RT2944-5AB01**		1	1 unit	41B
	42	--	--	--	X	**3RT2944-5AD01**		1	1 unit	41B
	48	--	--	--	X	**3RT2944-5AH01**		1	1 unit	41B
	110	--	--	--	X	**3RT2944-5AF01**		1	1 unit	41B
	230	--	--	--	X	**3RT2944-5AP01**		1	1 unit	41B
	400	--	--	--	X	**3RT2944-5AV01**		1	1 unit	41B
	--	24	--	--	X	**3RT2944-5AC21**		1	1 unit	41B
	--	42	--	--	X	**3RT2944-5AD21**		1	1 unit	41B
	--	48	--	--	X	**3RT2944-5AH21**		1	1 unit	41B
	--	110	--	--	X	**3RT2944-5AG21**		1	1 unit	41B
	--	220	--	--	X	**3RT2944-5AN21**		1	1 unit	41B
	--	230	--	--	X	**3RT2944-5AL21**		1	1 unit	41B
	110	--	120	--	X	**3RT2944-5AK61**		1	1 unit	41B
	220	--	240	--	X	**3RT2944-5AP61**		1	1 unit	41B
	--	--	480	--	X	**3RT2944-5AV61**		1	1 unit	41B
	--	--	600	--	X	**3RT2944-5AT61**		1	1 unit	41B
	--	100	110	--	X	**3RT2944-5AG61**		1	1 unit	41B
	--	200	220	--	X	**3RT2944-5AN61**		1	1 unit	41B
	--	400	440	--	X	**3RT2944-5AR61**		1	1 unit	41B
Solenoid coils · AC/DC operation, with varistor										
Size S2										
3RT203.-.A, 3RT233.-.A, 3RT253.-.A	--	20 ... 33	--	20 ... 33	5	**3RT2934-5NB31**		1	1 unit	41B
	--	30 ... 42	--	30 ... 42	5	**3RT2934-5ND31**		1	1 unit	41B
	--	48 ... 80	--	48 ... 80	5	**3RT2934-5NE31**		1	1 unit	41B
	--	83 ... 155	--	83 ... 155	5	**3RT2934-5NF31**		1	1 unit	41B
	--	175 ... 280	--	175 ... 280	5	**3RT2934-5NP31**		1	1 unit	41B
Size S3 NEW										
3RT2.4.-.A	--	20 ... 33	--	20 ... 33	X	**3RT2944-5NB31**		1	1 unit	41B
	--	30 ... 42	--	30 ... 42	X	**3RT2944-5ND31**		1	1 unit	41B
	--	48 ... 80	--	48 ... 80	X	**3RT2944-5NE31**		1	1 unit	41B
	--	83 ... 155	--	83 ... 155	X	**3RT2944-5NF31**		1	1 unit	41B
	--	175 ... 280	--	175 ... 280	X	**3RT2944-5NP31**		1	1 unit	41B

Note:
It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils.

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage U_s	Screw connection Order No.	Spring-type connection Order No.	Weight approx. kg
Coils · AC operation						
3RT19 24-5A . 01 	**S0**	3RT10 2 ., 3RT13 2 ., 3RT15 2 .	24 V, 50 Hz	**3RT19 24-5AB01**	**3RT19 24-5AB02**	0.069
			42 V, 50 Hz	**3RT19 24-5AD01**	**3RT19 24-5AD02**	
			48 V, 50 Hz	**3RT19 24-5AH01**	**3RT19 24-5AH02**	
			110 V, 50 Hz	**3RT19 24-5AF01**	**3RT19 24-5AF02**	
			230 V, 50 Hz	**3RT19 24-5AP01**	**3RT19 24-5AP02**	
			400 V, 50 Hz	**3RT19 24-5AV01**	**3RT19 24-5AV02**	
			24 V, 50/60 Hz	**3RT19 24-5AC21**	**3RT19 24-5AC22**	
			42 V, 50/60 Hz	**3RT19 24-5AD21**	**3RT19 24-5AD22**	
			48 V, 50/60 Hz	**3RT19 24-5AH21**	**3RT19 24-5AH22**	
			110 V, 50/60 Hz	**3RT19 24-5AG21**	**3RT19 24-5AG22**	
			208 v, 50/60 Hz	**3RT19 24-5AM21**	**3RT19 24-5AM22**	
			220 V, 50/60 Hz	**3RT19 24-5AN21**	**3RT19 24-5AN22**	
			230 V, 50/60 Hz	**3RT19 24-5AL21**	**3RT19 24-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 24-5AK61**	**3RT19 24-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 24-5AP61**	**3RT19 24-5AP62**	
			277 V, 60 Hz	**3RT19 24-5AU61**	**3RT19 24-5AU62**	
			480 V, 60 Hz	**3RT19 24-5AV61**	**3RT19 24-5AV62**	
			600 V, 60 Hz	**3RT19 24-5AT61**	**3RT19 24-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 24-5AG61**	**3RT19 24-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 24-5AN61**	**3RT19 24-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 24-5AR61**	**3RT19 24-5AR62**	
3RT19 24-5A . 02 	**S2**	3RT10 33 3RT10 34	24 V, 50 Hz	**3RT19 34-5AB01**	**3RT19 34-5AB02**	0.088
			42 V, 50 Hz	**3RT19 34-5AD01**	**3RT19 34-5AD02**	
			48 V, 50 Hz	**3RT19 34-5AH01**	**3RT19 34-5AH02**	
			110 V, 50 Hz	**3RT19 34-5AF01**	**3RT19 34-5AF02**	
			230 V, 50 Hz	**3RT19 34-5AP01**	**3RT19 34-5AP02**	
			400 V, 50 Hz	**3RT19 34-5AV01**	**3RT19 34-5AV02**	
			42 V, 50/60 Hz	**3RT19 34-5AD21**	**3RT19 34-5AD22**	
			48 V, 50/60 Hz	**3RT19 34-5AH21**	**3RT19 34-5AH22**	
			24 V, 50/60 Hz	**3RT19 34-5AC21**	**3RT19 34-5AC22**	
			110 V, 50/60 Hz	**3RT19 34-5AG21**	**3RT19 34-5AG22**	
			208 V, 50/60 Hz	**3RT19 34-5AM21**	**3RT19 34-5AM22**	
			220 V, 50/60 Hz	**3RT19 34-5AN21**	**3RT19 34-5AN22**	
			230 V, 50/60 Hz	**3RT19 34-5AL21**	**3RT19 34-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 34-5AK61**	**3RT19 34-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 34-5AP61**	**3RT19 34-5AP62**	
			277 V, 60 Hz	**3RT19 34-5AU61**	**3RT19 34-5AU62**	
			480 V, 60 Hz	**3RT19 34-5AV61**	**3RT19 34-5AV62**	
			600 V, 60 Hz	**3RT19 34-5AT61**	**3RT19 34-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 34-5AG61**	**3RT19 34-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 34-5AN61**	**3RT19 34-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 34-5AR61**	**3RT19 34-5AR62**	
3RT19 34-5A . 01 		3RT10 35, 3RT10 36, 3RT13 3 ., 3RT15 3 .	24 V, 50 Hz	**3RT19 35-5AB01**	**3RT19 35-5AB02**	0.088
			42 V, 50 Hz	**3RT19 35-5AD01**	**3RT19 35-5AD02**	
			48 V, 50 Hz	**3RT19 35-5AH01**	**3RT19 35-5AH02**	
			110 V, 50 Hz	**3RT19 35-5AF01**	**3RT19 35-5AF02**	
			230 V, 50 Hz	**3RT19 35-5AP01**	**3RT19 35-5AP02**	
			400 V, 50 Hz	**3RT19 35-5AV01**	**3RT19 35-5AV02**	
			24 V, 50/60 Hz	**3RT19 35-5AC21**	**3RT19 35-5AC22**	
			42 V, 50/60 Hz	**3RT19 35-5AD21**	**3RT19 35-5AD22**	
			48 V, 50/60 Hz	**3RT19 35-5AH21**	**3RT19 35-5AH22**	
			110 V, 50/60 Hz	**3RT19 35-5AG21**	**3RT19 35-5AG22**	
			208 V, 50/60 Hz	**3RT19 35-5AM21**	**3RT19 35-5AM22**	
			220 V, 50/60 Hz	**3RT19 35-5AN21**	**3RT19 35-5AN22**	
			230 V, 50/60 Hz	**3RT19 35-5AL21**	**3RT19 35-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 35-5AK61**	**3RT19 35-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 35-5AP61**	**3RT19 35-5AP62**	
			277 V, 60 Hz	**3RT19 35-5AU61**	**3RT19 35-5AU62**	
			480 V, 60 Hz	**3RT19 35-5AV61**	**3RT19 35-5AV62**	
			600 V, 60 Hz	**3RT19 35-5AT61**	**3RT19 35-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 35-5AG61**	**3RT19 35-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 35-5AN61**	**3RT19 35-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 35-5AR61**	**3RT19 35-5AR62**	

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage U_s	Screw connection Order No.	Spring-type connection Order No.	Weight approx. kg
Coils · AC operation						
3RT19 44-5A . 01 	**S3**	3RT10 44	24 V, 50 Hz	**3RT19 44-5AB01**	**3RT19 44-5AB02**	0.130
			42 V, 50 Hz	**3RT19 44-5AD01**	**3RT19 44-5AD02**	
			48 V, 50 Hz	**3RT19 44-5AH01**	**3RT19 44-5AH02**	
			110 V, 50 Hz	**3RT19 44-5AF01**	**3RT19 44-5AF02**	
			230 V, 50 Hz	**3RT19 44-5AP01**	**3RT19 44-5AP02**	
			400 V, 50 Hz	**3RT19 44-5AV01**	**3RT19 44-5AV02**	
			24 V, 50/60 Hz	**3RT19 44-5AC21**	**3RT19 44-5AC22**	
			42 V, 50/60 Hz	**3RT19 44-5AD21**	**3RT19 44-5AD22**	
			48 V, 50/60 Hz	**3RT19 44-5AH21**	**3RT19 44-5AH22**	
			110 V, 50/60 Hz	**3RT19 44-5AG21**	**3RT19 44-5AG22**	
			208 V, 50/60 Hz	**3RT19 44-5AM21**	**3RT19 44-5AM22**	
			220 V, 50/60 Hz	**3RT19 44-5AN21**	**3RT19 44-5AN22**	
			230 V, 50/60 Hz	**3RT19 44-5AL21**	**3RT19 44-5AL22**	
			110 V, 50 Hz/120 V, 60 Hz	**3RT19 44-5AK61**	**3RT19 44-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 44-5AP61**	**3RT19 44-5AP62**	
			277 V, 60 Hz	**3RT19 44-5AU61**	**3RT19 44-5AU62**	
			480 V, 60 Hz	**3RT19 44-5AV61**	**3RT19 44-5AV62**	
			600 V, 60 Hz	**3RT19 44-5AT61**	**3RT19 44-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 44-5AG61**	**3RT19 44-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 44-5AN61**	**3RT19 44-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 44-5AR61**	**3RT19 44-5AR62**	
3RT19 45-5A . 01 		3RT10 45, 3RT10 46, 3RT13 4 ., 3RT14 46	24 V, 50 Hz	**3RT19 45-5AB01**	**3RT19 45-5AB02**	0.130
			42 V, 50 Hz	**3RT19 45-5AD01**	**3RT19 45-5AD02**	
			48 V, 50 Hz	**3RT19 45-5AH01**	**3RT19 45-5AH02**	
			110 V, 50 Hz	**3RT19 45-5AF01**	**3RT19 45-5AF02**	
			230 V, 50 Hz	**3RT19 45-5AP01**	**3RT19 45-5AP02**	
			400 V, 50 Hz	**3RT19 45-5AV01**	**3RT19 45-5AV02**	
			24 V, 50/60 Hz	**3RT19 45-5AC21**	**3RT19 45-5AC22**	
			42 V, 50/60 Hz	**3RT19 45-5AD21**	**3RT19 45-5AD22**	
			48 V, 50/60 Hz	**3RT19 45-5AH21**	**3RT19 45-5AH22**	
			110 V, 50/60 Hz	**3RT19 45-5AG21**	**3RT19 45-5AG22**	
			208 V, 50/60 Hz	**3RT19 45-5AM21**	**3RT19 45-5AM22**	
			220 V, 50/60 Hz	**3RT19 45-5AN21**	**3RT19 45-5AN22**	
			230 V, 50/60 Hz	**3RT19 45-5AL21**	**3RT19 45-5AL22**	
3RT19 45-5AP02 			110 V, 50 Hz/120 V, 60 Hz	**3RT19 45-5AK61**	**3RT19 45-5AK62**	
			220 V, 50 Hz/240 V, 60 Hz	**3RT19 45-5AP61**	**3RT19 45-5AP62**	
			277 V, 60 Hz	**3RT19 45-5AU61**	**3RT19 45-5AU62**	
			480 V, 60 Hz	**3RT19 45-5AV61**	**3RT19 45-5AV62**	
			600 V, 60 Hz	**3RT19 45-5AT61**	**3RT19 45-5AT62**	
			100 V, 50/60 Hz/110 V, 60 Hz	**3RT19 45-5AG61**	**3RT19 45-5AG62**	
			200 V, 50/60 Hz/220 V, 60 Hz	**3RT19 45-5AN61**	**3RT19 45-5AN62**	
			400 V, 50/60 Hz/440 V, 60 Hz	**3RT19 45-5AR61**	**3RT19 45-5AR62**	
Coils · DC operation						
3RT19 44-5BM42 	**S2**	3RT10 3 ., 3RT13 3 ., 3RT15 3 .	24 V	**3RT19 34-5BB41**	**3RT19 34-5BB42**	0.558
			42 V	**3RT19 34-5BD41**	**3RT19 34-5BD42**	
			48 V	**3RT19 34-5BW41**	**3RT19 34-5BW42**	
			60 V	**3RT19 34-5BE41**	**3RT19 34-5BE42**	
			110 V	**3RT19 34-5BF41**	**3RT19 34-5BF42**	
			125 V	**3RT19 34-5BG41**	**3RT19 34-5BG42**	
			220 V	**3RT19 34-5BM41**	**3RT19 34-5BM42**	
			230 V	**3RT19 34-5BP41**	**3RT19 34-5BP42**	
	S3	3RT10 4 ., 3RT13 4 ., 3RT14 4 .	24 V	**3RT19 44-5BB41**	**3RT19 44-5BB42**	0.916
			42 V	**3RT19 44-5BD41**	**3RT19 44-5BD42**	
			48 V	**3RT19 44-5BW41**	**3RT19 44-5BW42**	
			60 V	**3RT19 44-5BE41**	**3RT19 44-5BE42**	
			110 V	**3RT19 44-5BF41**	**3RT19 44-5BF42**	
			125 V	**3RT19 44-5BG41**	**3RT19 44-5BG42**	
			220 V	**3RT19 44-5BM41**	**3RT19 44-5BM42**	
			230 V	**3RT19 44-5BP41**	**3RT19 44-5BP42**	

Selection and ordering data

	For contactor Size	Type	Rated control supply voltage $U_{s\,min}$ to $U_{s\,max}$ AC/DC V	Order No.	Weight approx. kg
Withdrawable coils					
	Conventional operating mechanism				
3RT19 55-5A... 	**S6**	3RT10 5, 3RT14 5	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 55-5AB31** **3RT19 55-5AD31** **3RT19 55-5AF31** **3RT19 55-5AM31** **3RT19 55-5AP31** **3RT19 55-5AU31** **3RT19 55-5AV31** **3RT19 55-5AR31** **3RT19 55-5AS31** **3RT19 55-5AT31**	0.49
	S10	3RT10 6, 3RT14 6	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 65-5AB31** **3RT19 65-5AD31** **3RT19 65-5AF31** **3RT19 65-5AM31** **3RT19 65-5AP31** **3RT19 65-5AU31** **3RT19 65-5AV31** **3RT19 65-5AR31** **3RT19 65-5AS31** **3RT19 65-5AT31**	0.65
		3RT12 6 Vacuum contactor	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 66-5AB31** **3RT19 66-5AD31** **3RT19 66-5AF31** **3RT19 66-5AM31** **3RT19 66-5AP31** **3RT19 66-5AU31** **3RT19 66-5AV31** **3RT19 66-5AR31** **3RT19 66-5AS31** **3RT19 66-5AT31**	
	S12	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	23 ... 26 42 ... 48 110 ... 127 200 ... 220 220 ... 240 240 ... 277 380 ... 420 440 ... 480 500 ... 550 575 ... 600	**3RT19 75-5AB31** **3RT19 75-5AD31** **3RT19 75-5AF31** **3RT19 75-5AM31** **3RT19 75-5AP31** **3RT19 75-5AU31** **3RT19 75-5AV31** **3RT19 75-5AR31** **3RT19 75-5AS31** **3RT19 75-5AT31**	1.1
Withdrawable coils					
	Solid-state operating mechanism · for DC 24 V PLC output				
3RT19 55-5N... 	**S6**	3RT10 5, 3RT14 5	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 55-5NB31** **3RT19 55-5NF31** **3RT19 55-5NP31**	0.49
	S10	3RT10 6, 3RT14 6	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 65-5NB31** **3RT19 65-5NF31** **3RT19 65-5NP31**	0.65
		3RT12 6 Vacuum contactor	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 66-5NB31** **3RT19 66-5NF31** **3RT19 66-5NP31**	
	S12	3RT10 7, 3RT14 7, 3RT12 7 Vacuum contactor	21 ... 27.3 96 ... 127 200 ... 277	**3RT19 75-5NB31** **3RT19 75-5NF31** **3RT19 75-5NP31**	1.1
	Solid-state operating mechanism · for DC 24 V PLC output/PLC relay output, with remaining lifetime indication (withdrawable coil with lateral electronics module)				
	S6	3RT10 5, 3RT14 5	96 ... 127 200 ... 277	**3RT19 55-5PF31** **3RT19 55-5PP31**	1.1
	S10	3RT10 6, 3RT14 6	96 ... 127 200 ... 277	**3RT19 65-5PF31** **3RT19 65-5PP31**	1.1
	S12	3RT10 7, 3RT14 7	96 ... 127 200 ... 277	**3RT19 75-5PF31** **3RT19 75-5PP31**	1.1

Selection and ordering data

For contactor Size	Type	Design	Order No.	Weight approx. kg	Pack.
Arc chutes					
S2	3RT20 3 . 3RT20 3 .	For AC coil contactors only For UC (AC/DC) coil contactors only	**3RT29 36-7A** **3RT29 36-7B**		1 unit
S3	3RT10 4 ., 3RT14 46		**3RT19 46-7A**		
S6	3RT10 54 3RT10 55 3RT10 56		**3RT19 54-7A** **3RT19 55-7A** **3RT19 56-7A**	0.72	
S10	3RT10 64 3RT10 65 3RT10 66		**3RT19 64-7A** **3RT19 65-7A** **3RT19 66-7A**	1.24	
S12	3RT10 75 3RT10 76		**3RT19 75-7A** **3RT19 76-7A**	1.4	
S6 **S10** **S12**	3RT14 56 3RT14 66 3RT14 76		**3RT19 56-7B** **3RT19 66-7B** **3RT19 76-7B**	0.72 1.24 1.4	
Contacts with fixing parts					
• for contactors with 3 main contacts					
S2	3RT20 35 3RT20 36 3RT20 37 3RT20 38	Main contacts (3 NO) for AC-3 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	**3RT29 35-6A** **3RT29 36-6A** **3RT29 37-6A** **3RT29 38-6A**		1 set
S3	3RT10 44 3RT10 45 3RT10 46		**3RT19 44-6A** **3RT19 45-6A** **3RT19 46-6A**		
S6	3RT10 54 3RT10 55 3RT10 56		**3RT19 54-6A** **3RT19 55-6A** **3RT19 56-6A**	0.28	
S10	3RT10 64 3RT10 65 3RT10 66		**3RT19 64-6A** **3RT19 65-6A** **3RT19 66-6A**	0.48	
S12	3RT10 75 3RT10 76		**3RT19 75-6A** **3RT19 76-6A**	0.9	
S3	3RT14 46	Main contacts (3 NO) for AC-1 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	**3RT19 46-6D**		
S6 **S10** **S12**	3RT14 56 3RT14 66 3RT14 76		**3RT19 56-6D** **3RT19 66-6D** **3RT19 76-6D**	0.28 0.48 0.9	
• for 3RT12 vacuum contactors					
S10	3RT12 64 3RT12 65 3RT12 66	3 vacuum interrupters with fixing parts	**3RT19 64-6V** **3RT19 65-6V** **3RT19 66-6V**	1.4	1 set
S12	3RT12 75 3RT12 76		**3RT19 75-6V** **3RT19 76-6V**	1.5	
• for contactors with 4 main contacts					
S2	3RT23 36 3RT23 37	Main contacts (4 NO contacts) for utilization category AC-1	**3RT29 36-6E** **3RT29 37-6E**		1 set
S3	3RT13 44 3RT13 46	(1 set = 4 moving and 8 fixed contacts with fixing parts)	**3RT19 44-6E** **3RT19 46-6E**		

Selection and ordering data

Coil type Rated control supply voltage U_s	Control supply voltage at	3TY6 503-0A.. 3TY6 523-0A.. 3TY6 543-0A.. 3TY6 566-0A..	3TB50 3TB52 3TB54 3TB56	3TY7 683-0C.. 3TY7 693-0C..	3TF68 3TF69
Rated control supply voltages (changes to 10th and 11th positions of the Order No.)					
AC operation					
Coils for 50 Hz 50 Hz	60 Hz				
AC 24 V	**AC 39 V**	**B0**		**–**	
AC 32 V	**AC 28 V**	**–**		**–**	
AC 36 V	**AC 42 V**	**G0**		**–**	
AC 42 V	**AC 50 V**	**D0**		**–**	
AC 48 V	**AC 58 V**	**H0**		**–**	
AC 60 V	**AC 72 V**	**E0**		**–**	
AC 110 V	**AC 132 V**	**F0**		**–**	
AC 125/127 V	**AC 150/152 V**	**L0**		**–**	
AC 230/220 V	**AC 277 V**	**P0** [1]		**–**	
AC 240 V	**AC 288 V**	**U0**		**–**	
AC 400/380 V	**AC 480/460 V**	**V0** [1]		**–**	
AC 415 V	**AC 500 V**	**R0**		**–**	
AC 500 V	**AC 600 V**	**S0**		**–**	
Coils for 50/60 Hz					
AC 110 V ... 132 V		**–**		**F7**	
AC 200 V ... 240 V		**–**		**M7**	
AC 230 V ... 277 V		**–**		**P7** [2]	
AC 380 V ... 460 V		**–**		**Q7**	
AC 500 V ... 600 V		**–**		**S7**	

Coil type Rated control supply voltage U_s	3TY6 503-0B.. 3TY6 523-0B.. 3TY6 543-0B.. 3TY6 563-0B..	3TB50 3TB52 3TB54 3TB56	3TY7 683-0D.. 3TY7 693-0D..	3TF68 3TF69
Rated control supply voltages (changes to 10th and 11th positions of the Order No.)				
DC operation				
DC 24 V	**B4**		**B4**	
DC 30 V	**C4**		**–**	
DC 36 V	**V4**		**–**	
DC 42 V	**D4**		**–**	
DC 48 V	**W4**		**–**	
DC 60 V	**E4**		**–**	
DC 110 V	**F4**		**F4**	
DC 125 V	**G4**		**G4**	
DC 180 V	**K4**		**–**	
DC 220 V	**M4**		**M4**	
DC 230 V	**P4**		**P4**	

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Coil voltage tolerance at 220 V or 380 V: 0.85 to 1.15 x U_s; lower tolerance range limit acc. to IEC 60 947.

2) Lower tolerance range limit at 220 V: 0.85 x U_s acc. to IEC 60 947.

Coils, AC[1)]

3TY6463-0AK6

Frame Size	Catalog No						
	24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
3TB40–44	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0
3TB47–48	3TY6483-0AC1	3TY6483-0AK6	3TY6483-0AM1	3TY6483-0AP6	3TY6483-0AP0	3TY6483-0AV0	3TY6483-0AS0
3TB52	—	3TY6523-0AK6	3TY6523-0AM1	3TY6523-0AP6	3TY6523-0AP0	3TY6523-0AV0	—
3TB56	—	—	—	—	3TY6566-0AP0	3TY6566-0AV0	3TY6566-0AS0

Coils, DC

3TY6483-0BB4

Frame Size	Catalog No						
	12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC
3TB40–43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4
3TB44	3TY6443-0BA4	3TY6443-0BB4	3TY6443-0BD4	3TY6443-0BW4	3TY6443-0BF4	3TY6443-0BG4	3TY6443-0BQ4
3TB46	—	—	3TY6463-0BD4	3TY6463-0BW4	3TY6463-0BF4	—	3TY6463-0BQ4
3TB47–48	—	3TY6483-0BB4	3TY6483-0BD4	3TY6483-0BW4	3TY6483-0BF4	3TY6483-0BG4	—
3TB50	—	3TY6503-0BB4	3TY6503-0BD4	3TY6503-0BW4	3TY6503-0BF4	3TY6503-0BG4	3TY6503-0BQ4
3TB52	—	3TY6523-0BB4	3TY6523-0BD4	—	3TY6523-0BF4	3TY6523-0BG4	—
3TB54	—	3TY6543-0BB4	3TY6543-0BD4	3TY6543-0BW4	3TY6543-0BF4	—	3TY6543-0BQ4
3TB56	—	3TY6563-0BB4	3TY6563-0BD4	—	3TY6563-0BF4	3TY6563-0BG4	3TY6563-0BQ4
3TB58	—	—	—	—	—	—	—

Main Contacts (Includes 3 Moving and 6 Fixed Contacts)[2)]

3TY6500-0A

Frame Size	Catalog No
3TB40–43	Not Replaceable
3TB44	3TY6440-0A
3TB46	3TY6460-0A
3TB47	3TY6470-0A
3TB48	3TY6480-0A
3TB50	3TY6500-0A
3TB52	3TY6520-0A
3TB54	3TY6540-0A
3TB56	3TY6560-0A
3TB58	3TY6580-0A

Select Complete Catalog Number From Above[1)]	
Old Number	New Number
3TY6465-0A††	3TY6463-0A††
3TY6485-0A††	3TY6483-0A††
3TY6505-0A††	3TY6503-0A††
3TY6525-0A††	3TY6523-0A††
3TY6545-0A††	3TY6543-0A††
3TY6565-0A††	3TY6566-0A††

Coil Voltages	
Old Number	New Number
A8	K6
B8	M1
C8	P6
D8	Q0
E8	S0
F8	C1
G8	P0

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1)Some old 3TB coil catalog numbers have been superceded. Cross to current catalog number from these tables.
2)Main contact kits for size 3TB47 and larger include springs. Smaller sizes do not.

Coils, AC Type 3TF and CRLtF

3TY7403-0AK6

3TY7483-0AK6

Frame Size	Catalog No						
	24V AC, 60Hz 24V AC, 50Hz	120V AC, 60Hz 110V AC, 50Hz	208V AC, 60Hz 173V AC, 50Hz	240V AC, 60Hz 220V AC, 50Hz	277V AC, 60Hz 220V AC, 50Hz	460V AC, 60Hz 380V AC, 50Hz	600V AC, 60Hz 500V AC, 50Hz
3TF40–43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0
3TF34–35, 3TF44–45	3TY7443-0AC2	3TY7443-0AK6	3TY7443-0AM1	3TY7443-0AP6	3TY7443-0AU1	3TY7443-0AV0	3TY7443-0AS0
3TF46–47	3TY7463-0AC2	3TY7463-0AK6	3TY7463-0AM1	3TY7463-0AP6	3TY7463-0AU1	3TY7463-0AV0	3TY7463-0AS0
3TF48–49	3TY7483-0AC2	3TY7483-0AK6	3TY7483-0AM1	3TY7483-0AP6	3TY7483-0AU1	3TY7483-0AV0	3TY7483-0AS0
3TF50–51	3TY7503-0AC2	3TY7503-0AK6	3TY7503-0AM1	3TY7503-0AP6	3TY7503-0AU1	3TY7503-0AV0	3TY7503-0AS0
3TF52–53	3TY7523-0AC2	3TY7523-0AK6	3TY7523-0AM1	3TY7523-0AP6	3TY7523-0AU1	3TY7523-0AV0	3TY7523-0AS0
3TF54–55	3TY7543-0AC2	3TY7543-0AK6	3TY7543-0AM1	3TY7543-0AP6	3TY7543-0AU1	3TY7543-0AV0	3TY7543-0AS0
3TF56	3TY7563-0AC2	3TY7563-0AK6	3TY7563-0AM1	3TY7563-0AP6	3TY7563-0AU1	3TY7563-0AV0	3TY7563-0AS0
3TF57	—	3TY7573-0CF7	—	3TY7573-0CM7	—	3TY7573-0CQ7	—
3TF68	—	3TY7683-0CF7	—	3TY7683-0CM7	—	3TY7683-0CQ7	3TY7683-0CS7
3TF69	—	3TY7693-0CF7	—	3TY7693-0CM7	—	3TY7693-0CQ7	3TY7693-0CS7

Coils, DC Type 3TF and CRLtF

3TY4803-0BB4

Frame Size	Catalog No						
	12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC
DC Solenoid							
3TF30–33 3TF40–43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4
3TF34–35, 3TF44–45	3TY7443-0BA4	3TY7443-0BB4	3TY7443-0BD4	3TY7443-0BW4	3TY7443-0BF4	3TY7443-0BG4	—
3TF46–47	—	3TY7463-0BB4	3TY7463-0BD4	3TY7463-0BW4	—	3TY7463-0BG4	3TY7463-0BQ4
DC Economy Circuit (Replacement coils only. Does not include interlock or interposing relay.)							
3TF46–47	—	3TY7463-0DB4	3TY7463-0DD4	3TY7463-0DW4	3TY7463-0DF4	3TY7463-0DG4	3TY7463-0DQ4
3TF48–49	—	—	3TY7483-0DD4	3TY7483-0DW4	3TY7483-0DF4	3TY7483-0DG4	3TY7483-0DQ4
3TF50–51	—	3TY7503-0DB4	3TY7503-0DD4	3TY7503-0DW4	3TY7503-0DF4	3TY7503-0DG4	3TY7503-0DQ4
3TF52–53	—	3TY7523-0DB4	3TY7523-0DD4	3TY7523-0DW4	3TY7523-0DF4	3TY7523-0DG4	3TY7523-0DQ4
3TF54–55	—	—	3TY7543-0DD4	3TY7543-0DW4	3TY7543-0DF4	3TY7543-0DG4	3TY7543-0DQ4
3TF56	—	3TY7563-0DB4	3TY7563-0DD4	3TY7563-0DW4	—	3TY7563-0DG4	3TY7563-0DQ4
3TF57	—	3TY7573-0DB4	3TY7573-0DD4	3TY7573-0DW4	3TY7573-0DF4	3TY7573-0DG4	3TY7573-0DQ4
3TF68	—	3TY7683-0DB4	—	—	3TY7683-0DF4	—	—

Main Contacts (Includes 3 Moving and 6 Fixed Contacts)

3TY7460-0A

Frame Size	Catalog No	List Price $
3TF30–35	Not Replaceable	
3TF40–43	Not Replaceable	
3TF44	3TY7440-0A	
3TF45	3TY7450-0A	
3TF46	3TY7460-0A	
3TF47	3TY7470-0A	
3TF48	3TY7480-0A	
3TF49	3TY7490-0A	
3TF50	3TY7500-0A	
3TF51	3TY7510-0A	
3TF52	3TY7520-0A	
3TF53	3TY7530-0A	
3TF54	3TY7540-0A	
3TF55	3TY7550-0A	
3TF56	3TY7560-0A	
3TF57	3TY7570-0A	
3TF68	3TY7680-0B[1])	
3TF69	3TY7690-0B[1])	

Arc Chutes

3TY7482-0A

Frame Size	Catalog No
3TF30–35	Not Replaceable
3TF40–43	Not Replaceable
3TF44	3TY7442-0A
3TF45	3TY7452-0A
3TF46	3TY7462-0A
3TF47	3TY7472-0A
3TF48	3TY7482-0A
3TF50	3TY7502-0A
3TF51	3TY7512-0A
3TF52	3TY7522-0A
3TF53	3TY7532-0A
3TF54	3TY7542-0A
3TF55	3TY7552-0A
3TF56	3TY7562-0A
3TF57	3TY7572-0A
3TF68	Not Available
3TF69	Not Available

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Vacuum bottles with mounting hardware.

Auxiliary Contact Blocks


3TY7561-1A

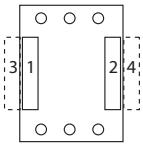


Illustration	Frame Size	Auxiliary Contacts NO	Auxiliary Contacts NC	NO/Early Make	NC/Early Break	Auxiliary Contact Mounting Position	Position	Block Location	Obsolete Catalog No	Current Catalog
	3TF30 to 3TF35, 3TH3	1	—	—	—		—	Top	—	3TX4010-2A
		—	1	—	—		—	Top	—	3TX4001-2A
		—	—	1	—		—	Top	—	3TX4010-4A
		—	—	—	1		—	Top	—	3TX4001-4A
	3TF40 to 3TF43	Not Replaceable								
	3TF44 to 3TF68	1	1	—	—		1	Left	3TY7561-1A	3TY7561-1AA00
		1	1	—	—		2	Right	3TY7561-1B	3TY7561-1AA00
		1	—	—	1		4	Right	3TY7561-1K	3TY7561-1EA00
	3TF46 to 3TF68	1	1	—	—		3	Left	3TY7561-1K	3TY7561-1KA00
	2nd Aux Contact Block	1	1	—	—		4	Right	3TY7561-1L	3TY75611KA00
	3TF46 to 3TF68	1	1	—	—		3	Left	3TY7561-1U	3TY7561-1UA00
	For Electronic Circuits	1	1	—	—		4	Right	3TY7561-1V	3TY7561-1UA00

Mechanical Interlocks


3TX7466-1A

Frame Size	Catalog No
3TF44-54	3TX7466-1A

Arc Chutes


3TY6462-0A

Type	Frame Size	Catalog No	List Price $	Frame Size	Catalog No
3TB	3TB40–43	Not Replaceable		3TB50	3TY6502-0A
	3TB44	—		3TB52	3TY6522-0A
	3TB46	—		3TB54	3TY6542-0A
	3TB47	—		3TB56	3TY6562-0A
	3TB48	3TY6482-0A		3TB58	—

Control Relays, Type 3TH3, 3TH4 Coils, AC


3TY7403-0AK6

Type	Frame Size	Catalog No 24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
3TH	3TH30–33 3TH40–43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0

Coils, DC

Type	Frame Size	Catalog No 12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC
3TH	3TH30–33 3TH40–43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4

Auxiliary Contact Blocks[1)]

Type	Frame Size	Auxiliary Contacts NO	Auxiliary Contacts NC	Normally Open/ Early Make	Normally Closed/ Late Break	Block Location	Catalog No
3TH	3TH3	1	—	—	—	Top	3TX4010-2A
		—	1	—	—	Top	3TX4001-2A
		—	—	1	—	Top	3TX4010-4A
		—	—	—	1	Top	3TX4001-4A

Control Relays, Type 3TH8 Coils, AC

Type	Frame Size	Catalog No 24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
3TH	3TH80–83	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0

Coils, DC

Type	Frame Size	Catalog No 12V AC	24V AC	42V AC	48V AC	110V AC	125V AC	240V AC
3TH	3TH80–83	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Maximum 4 blocks per relay.

AC and DC operation

IEC 60 947, EN 60 947 (VDE 0660), UL 508

Design

The 3RT contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

The 3RT contactors are available screw, spring-type, or ring lug connections.

An auxiliary contact is integrated in the basic unit of size S00 contactors. The basic units of sizes S0 to S3 only contain the main conducting paths.

All the basic units can be extended with auxiliary switch blocks. Cabinet units with 2 NO + 2 NC (terminal designations acc. to EN 50 012) are available as of size S0; the auxiliary switch block is removable.

The size S3 contactors have removable box terminals for the main conductor connections. Ring cable lugs or bars can thus also be connected.

Contact reliability

If voltages ≤ 110 V and currents ≤ 100 mA are to be switched, the auxiliary contacts of 3RT contactors and 3RH contactor relays should be used to ensure good contact stability.

These auxiliary contacts are suitable for electronic circuits with currents ≥ 1 mA at a voltage of 17 V.

Short-circuit protection of contactors

For the short-circuit protection of contactors without an overload relay, see the technical data.

For the short-circuit protection of contactors with an overload relay, see section 3.

Motor protection

3RU overload relays can be mounted onto the 3RT contactors for protection against overloads. The overload relays must be ordered separately (see section 3).

Surge suppression

The 3RT contactors can be retrofitted with RC elements, varistors, diodes or diode assemblies (combination of an interference suppression diode and a Zener diode for short tripping times) for suppressing opening surges in the coil.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

With all size S0 to S3 contactors, varistors and RC elements can be plugged on directly at the coil terminals, either on the top or underneath. Diode assemblies are available in two different designs with different polarities. Depending on the application, they can be attached either only on the bottom (assembly with circuit-breaker) or only on the top (assembly with overload relay).

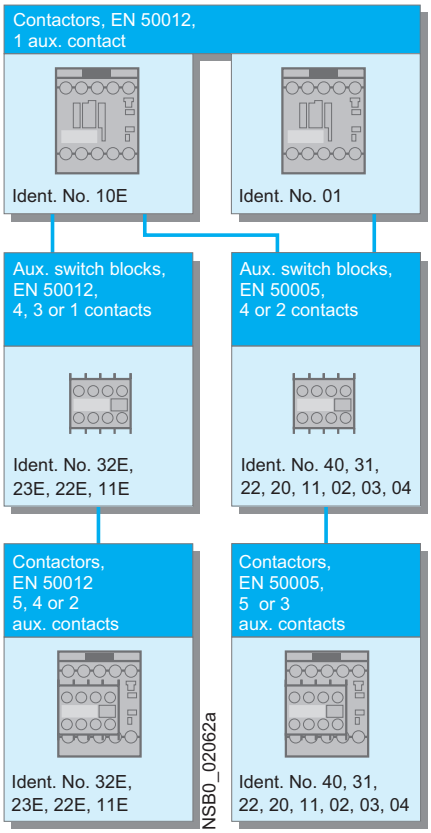
The plug-in direction of the diodes and diode assemblies is determined by a coding device. Exceptions: 3RT29 26-1E.00 and 3RT19 36-1T.00; in these cases the plug-in direction is identified by "+" and "–".

Coupling relays are supplied either without surge suppression or with a varistor or diode connected as standard, according to the design.

Note

The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (interference suppression diode 6 to 10 times; diode assemblies 2 to 6 times; varistor +2 ms to 5 ms).

3RT20 1. contactors (size S00),
Terminal designations acc. to EN 50 012 or DIN 50 005.



Auxiliary switch blocks

The 3RT basic units can be extended with various auxiliary switch blocks, depending on the application:

Size S00 (3RT201)

Contactors with one NO contact as the auxiliary contact and with either screw or spring-type connections, identification number 10E, can be extended to obtain contactors with 2, 4 or 5 auxiliary contacts in accordance with EN 50 012 using auxiliary switch blocks. The identification numbers 11E, 22E, 23E and 32E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks cannot be combined with contactors that have an NC contact in their basic unit, identification number 01, as these are coded.

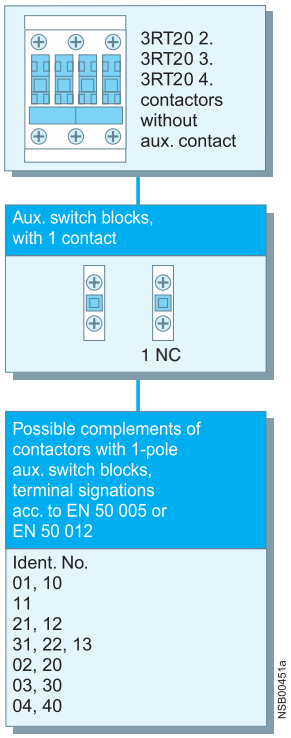
All size S00 contactors with one auxiliary contact, identification number 10E or 01, and the contactors with 4 main contacts can be extended to obtain contactors with 3 or 5 auxiliary contacts (contactors with 4 main contacts: 2 or 4 auxiliary contacts) according to EN 50 005 using auxiliary switch blocks with identification numbers 40 to 02. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary contacts.

Single or 2-pole auxiliary switch blocks that can be connected on either the top or the bottom facilitate quick, straightforward wiring, especially when assembling feeders. These auxiliary switch blocks are only available with screw-type terminals.

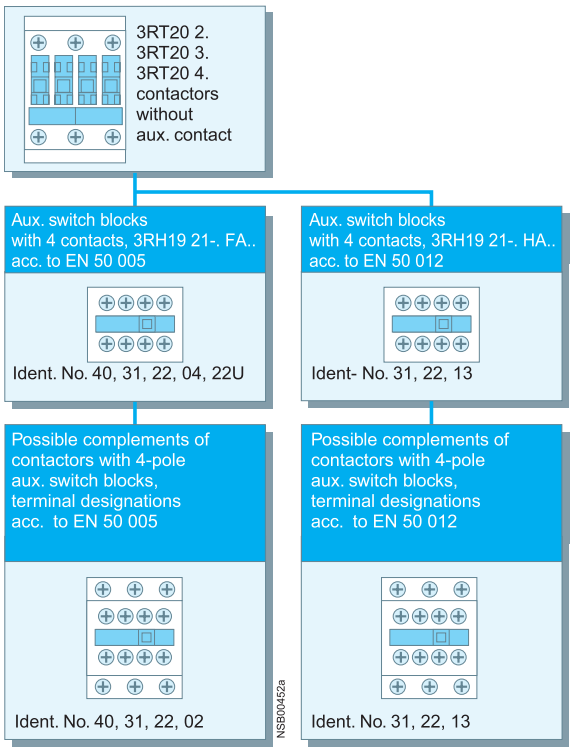
The solid-state compatible 3RH29 11-1NF.. auxiliary switch blocks for size S00 contactors contain two enclosed contact elements. They are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in dusty atmosphere. The contacts do not have positively-driven operation.

All the above-mentioned auxiliary switch variants can be snapped into the location holes on the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

3RT20 2. to 3RT20 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.



3RT20 2. to 3RT20 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.



Sizes S0 to S3 (3RT202 to 3RT204)

An extensive range of auxiliary switch blocks is available for various applications. The contactors themselves do not have an integrated auxiliary conducting path.

The auxiliary switch variants are identical for all size S0 to S3 contactors.

One 4-pole or up to four single-pole auxiliary switch blocks (with screw or spring-type connections) can be snapped onto the front of the contactors. When the contactors are energized, the NC contacts open before the NO contacts close.

The terminal designations of the single-pole auxiliary switch blocks consist of location digits on the basic unit and function digits on the auxiliary switch blocks.

In addition, 2-pole auxiliary switch blocks (screw-type terminals) are provided for cable entries from above or below in the style of a four-connector block (feeder auxiliary switch).

If the available installation depth is restricted, 2-pole auxiliary switch blocks (screw or spring-type connections) can be mounted laterally on the left or right.

The auxiliary switch blocks designed for mounting onto the front can be disassembled with the aid of a centrally positioned release lever; the laterally mountable auxiliary switch blocks can be removed easily by pressing on the fluted grips.

The terminal designations of the individual auxiliary switch blocks comply with EN 50 005 or EN 50 012, while those of the complete contactors with an auxiliary switch block with 2 NO + 2 NC comply with EN 50 012.

The laterally mountable auxiliary switch blocks to EN 50 012 can only be used if no 4-pole auxiliary switch blocks are snapped onto the front. If single-pole auxiliary switch blocks are used in addition, the location digits on the contactor must be noted.

Two enclosed contact elements and two standard contact elements are available for the 3RH29 21-.FE22 solid-state compatible auxiliary switch block mountable on the front. The laterally mountable 3RH29 21-2DE11 solid-state compatible auxiliary switch block contains 2 enclosed contact elements (1 NO + 1 NC). The enclosed contact elements are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in a dusty atmosphere. The contacts are positively driven.

Sizes S0 and S2 (3RT202 and 3RT203)

Up to four auxiliary contacts can be mounted, whereby any design of the auxiliary switch blocks is permitted. If two 2-pole, laterally mounted, auxiliary switch blocks are used, one must be mounted on the left and one on the right for the sake of symmetry.

Under certain circumstances, more auxiliary contacts are allowed for size S2 (please ask for details).

With regard to 3RT23 and 3RT24 4-pole contactors, please refer to pages 2/12 to 2/14.

Sizes S3 to S12 (3RT204 to 3RT107)

Up to eight auxiliary contacts can be mounted, whereby the following points must be noted:

- Of these eight auxiliary contacts, no more than four must be NC contacts.
- If laterally mounted auxiliary switch blocks are used, they must be symmetrical.

With regard to 3RT15 4-pole contactors, please refer to pages 2/13 to 2/15.

Overview

Design

- 3RT10 contactors for switching motors
- 3RT12 vacuum contactors for switching motors
- 3RT14 contactors for AC-1 applications

Operating mechanism

Two types of solenoid-operated mechanism are available:

- Conventional operating mechanism
- Solid-state operating mechanism (with 3 performance levels)

UC operation

The contactors can be AC (40 to 60 Hz) and DC driven.

Withdrawable coils

To allow easy coil changing, for example if the application is changed, the magnetic coil can be pulled out upwards without tools after the release mechanism has been actuated, and can be replaced by any other required coil of the same size.

Auxiliary contact complement

The contactors can be equipped with a maximum of 8 auxiliary contacts, with identical auxiliary switch blocks from S0 to S12. Of these, no more than 4 are permitted to be NC contacts.

- 3RT10 and 3RT14 contactors: auxiliary contacts mounted laterally and on front
- 3RT12 vacuum contactors: auxiliary contact mounted laterallv

Contactors with conventional operating mechanism

3RT1...-.A:

The magnetic coil is switched on and off directly with the control supply voltage U_s via terminals A1/A2.

Multi-voltage range for the control supply voltage U_s:
Several closely adjacent control supply voltages, available around the world, are covered by just one coil, for example UC 110-115-120-127 V or UC 220-230-240 V.

In addition, allowance is also made for a coil voltage tolerance of 0.8 times the lower rated control supply voltage ($U_{s\,min}$) and 1.1 times the upper rated control supply voltage ($U_{s\,max}$), within which the contactor switches reliably and no thermal overloading occurs.

Contactors with solid-state operating mechanism

The power required for reliable switching and holding is supplied selectively to the magnetic coil by series-connected control electronics.

Features:

- Extended voltage range for the control supply voltage U_s:
  Compared with the conventional operating mechanism, the solid-state operating mechanism covers an even broader range of globally available control supply voltages within one coil variant. For example, the globally available voltages 200-208-220-230-240-254-277 V are covered with the coil for UC 200 to 277 V ($U_{s\,min}$ to $U_{s\,max}$).
- Extended coil voltage tolerance 0.7 to 1.25 × U_s:
  On account of the broad range for the rated control supply voltage and the additionally allowed coil voltage tolerance of 0.8 × $U_{s\,min}$ to 1.1 × $U_{s\,max}$, an extended coil voltage tolerance of at least 0.7 to 1.25 × U_s, within which the contactors will operate reliably, is available for the most common control supply voltages of 24, 110 and 230 V.
- Bridging short-time voltage dips:
  Control voltage failures dipping to 0 V (at A1/A2) are bridged for up to approx. 25 ms, therefore preventing unintentional disconnection.
- Defined ON and OFF thresholds:
  As of voltages ≥ 0.8 × $U_{s\,min}$, the electronics reliably switch the contactor on and as of ≤ 0.5 × $U_{s\,min}$ it is reliably switched off. The differential travel in the switching thresholds prevents chattering of the main contacts and hence increased wear or welding when operated in weak, unstable networks. Similarly, thermal overloading of the contactor coil is prevented if the voltage applied is too low – the contactor is not switched on and is operated with overexcitation.
- Low control power consumption when closing and in closed state.

Electromagnetic compatibility (EMC)

The contactors with solid-state operating mechanism conform to the requirements for operation in industrial plants.

- **Noise immunity**
  – Burst (IEC 61 000-4-4): 4 kV
  – Surge (IEC 61 000-4-5): 4 kV
  – Electrostatic discharge, ESD (IEC 61 000-4-2): 8/15 kV
  – Electromagnetic field (IEC 61 000-4-3): 10 V/m
- **Emitted interference**
  Limiting value class A to EN 55 011

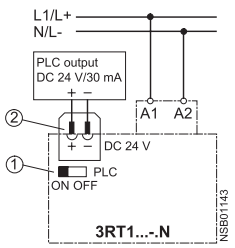
Note:
In connection with converters, the control cables should be installed separately from the load cables to the converter.

3RT1...-.N: for DC 24 V PLC output

2 control options:

- Control without an interface directly via a DC 24 V /≥ 30 mA PLC output (EN 61 131-2). Connection via a 2-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply. The control supply voltage for supplying power to the solenoid operating mechanism must be connected to A1/A2.

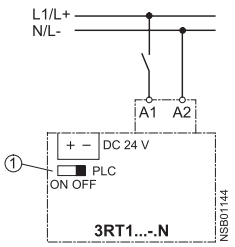
Note:
Before start-up, the sliding-dolly switch for PLC operation must be moved to the "PLC ON" position (setting ex works: "PLC OFF").



① Sliding-dolly switch, must be in PLC "ON" position
② Plug-in connection, 2-pole

- Conventional control by applying the control supply voltage at A1/A2 via a switching contact.

Note:
The sliding-dolly switch must be in the "PLC OFF" position (= setting ex works).

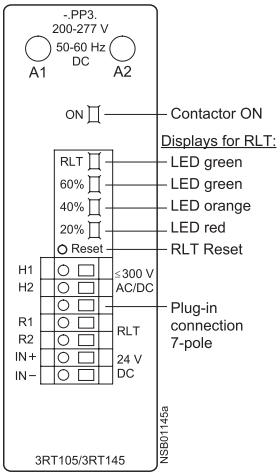


$ Sliding-dolly switch, must be in PLC "OFF" position

Overview

Contactors with solid-state operating mechanism

3RT1...-.P: for DC 24 V PLC output or PLC relay output, with indication of remaining lifetime
(Indication of remaining lifetime RLT: see 2/69.)



To supply power to the solenoid operating mechanism and the remaining lifetime indication, the control supply voltage U_s must be run to terminals A1/A2 of the laterally mounted electronics module. The control inputs of the contactor are brought out to a 7-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply.

- The remaining lifetime RLT status signal is available at terminals R1/R2 via a floating relay contact (hard gold-plated, enclosed) and can be processed for example via SIMOCODE-DP or PLC inputs or elsewhere.

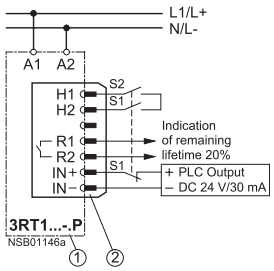
  Permissible current carrying capacity of relay output R1/R2:
  - I_e/AC-15/24 to 230 V: 3 A
  - I_e/DC-13/24 V: 1 A

- LED indicators

  The following statuses are indicated by LEDs on the laterally mounted electronics module:
  - Contactor ON (energized state):
    Green LED ("ON")
  - Indication of remaining lifetime (see 2/69)

2 control options:

- Contactor control without an interface directly via a DC 24 V /≥ 30 mA PLC output (EN 61 131-2) via terminals IN+/IN-.

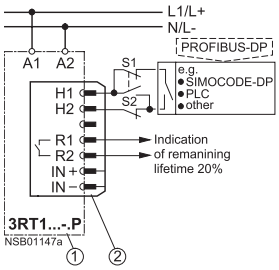


Electronics module of 3RT1 ...-.P contactor
Plug-in connection, 7-pole
S1 Changeover switch from automatic control via PLC semiconductor output to local control
S2 Local control option

Possibility of switching from automatic control to local control via terminals H1/H2, i.e. automatic control via a PLC or SIMOCODE-DP/PROFIBUS-DP can be deactivated, for example during start-up or in the event of a fault, and the contactor can be controlled manually.

- Contactor control via relay outputs, e.g. by
  – PLC
  – SIMOCODE-DP 3UF5
  via terminals H1/H2.
  Contact loading:
  U_s/approx. 5 mA.

When operated via SIMOCODE-DP, a communication link to PROFIBUS-DP is also provided.



Electronics module of 3RT1 ...-.P contactor
Plug-in connection, 7-pole
S1 Changeover switch from automatic control, e.g. via SIMOCODE-DP or PLC relay output to local control
S2 Local control option

3RT12 vacuum contactors

In contrast with the 3RT10 contactors – the main contacts operate in air under atmospheric conditions – the contact gaps of the 3RT12 vacuum contactors are contained in hermetically enclosed vacuum contact tubes. Neither arcs nor arcing gases are produced. The particular benefit of 3RT12 vacuum contactors, however, is that their electrical endurance is at least twice as long as that of 3RT10 contactors.

They are therefore particularly well suited to frequent switching in jogging/mixed operation, for example in crane control systems.

Advantages:
- Very long electrical endurance
- High short-time current-carrying capacity for heavy starting
- No open arcs, no arcing gases, i.e. no minimum clearances from earthed parts required either
- Longer maintenance intervals
- Increased plant availability

Notes on operation:
– Switching motors with rated operational voltages U_e > 500 V:
In order to damp overvoltages and protect the motor winding insulation against multiple reignition when switching off three-phase motors, it is recommended to fit the contactors on the outgoing side (T1/T2/T3) with the 3RT19 66-1PV. surge suppression module – RC varistor – (accessory).

This additional equipment is not required for operation in circuits with converters. It might be damaged by the voltage peaks and harmonics generated.

– Switching DC voltage:
Vacuum contactors are basically unsuitable for switching DC voltage.

Overview

The contactor assemblies for star-delta starting can be ordered as follows:

- Sizes S00-S0 as assemblies. (see pages 2/47-2/48)
- Sizes S2-S12 as components for customer assembly

Calculated horsepower ratings at 460 V AC			Size				Accessories for customer assembly	
HP	Operat. current I_e A	Motor current A		Line/delta contactor	WYE contactor		Time-delay relay	Installation kit A double infeed
30	50	9.5 ... 13.8 12.1 ... 17.2 15.5 ... 21.5 19 ... 27.6 24.1 ... 34 31 ... 43 37.9 ... 55.2 48.3 ... 65	**S2-S2-S0**	3RT2028 3RT2935	3RT2026		3RP2574-1N.30	3RA2933-2C [3])
50	80	62.1 ... 77.8	**S2-S2-S2**		3RT2035			3RA2933-2BB1 [3])
60	86	69 ... 86		3RT2036				
75	115	31 ... 43.1 37.9 ... 55.2 48.3 ... 69 62.1 ... 77.6 77.6 ... 108.6	**S3-S3-S2**	3RT2045	3RT2035		3RP2574-1N.30	3RA2943-2C [3])
100	150	98.3 ... 129.3 120.7 ... 150		3RT2045	3RT2036			
125	160	86 ... 160	**S6-S6-S3**	3RT1054	3RT2045		3RP2574-1N.30	
150	195	86 ... 195						
190	230	86 ... 230		3RT1055	3RT2046			
200	280	86 ... 280		3RT1056	3RT2046			
250	350	95 ... 350	**S10-S10-S6**	3RT1064	3RT1054		3RP2574-1N.30	
300	430	95 ... 430		3RT1065	3RT1056			
400	540	347 ... 540	**S12-S12-S10**	3RT1075	3RT1064		3RP2574-1N.30	
450	610	347 ... 610						
500	690	347 ... 690			3RT1065			
650	850	347 ... 850		3RT1076	3RT1066			

For accessories, see page 2/85.
For circuit diagrams, see page 2/202.

1) The installation kit contains mechanical interlock; 3 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and star contactor); WYE jumper.

2) The installation kit contains 5 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and WYE contactor); star jumper.

			Overload relay, thermal		Overload relay, solid-state	
Installation kit B for single infeed	WYE jumper	Baseplates	Range of overload relay, thermal [A]	Order No. overload relay, thermal	Range of overload relay, solid-state [A]	Order No. overload relay, solid-state
3RA1933-3D[4])	3RT1926-4BA31	3RA2932-2E	5.5 ... 8	3RU2136-1HB	–	–
			7 ... 10	3RU2136-1JB0	12.5 ... 50	3RB3036-1UB0
			9 ... 12.5	3RU2136-1KB0		
			11 ... 16	3RU2136-4AB0		
			14 ... 20	3RU2136-4BB0		
			18 ... 25	3RU2136-4DB0		
			22 ... 32	3RU2136-4EB0	20 ... 80	3RB3036-1WB0
			28 ... 40	3RU2136-4FB0		
	3RT1936-4BA31	3RA2932-2F	36 ... 45	3RU2136-4GB0		
			40 ... 50	3RU2136-4HB0		
3RA1943-3D[4])	3RT1946-4BA31	3RA2942-2E	28 ... 40	3RU2146-4FB0	12.5 ... 50	3RB3046-1UB0
			36 ... 45	3RU2146-4HB0		
			45 ... 63	3RU2146-4JB0		
			57 ... 75	3RU2146-4KB0		
			70 ... 90	3RU2146-4LB0	32 ... 115	3RB3046-1XB0
			80 ... 100[7])	3RU2146-4MB0		
3RA1953-3D[5])	3RT1946-4BA31	3RA1952-2E	–	–	50 ... 200	3RB2056-1FC2

3) Installation kit contains wiring connector on the bottom (connection between delta contactor and WYE contactor) and WYE jumper.

4) Wiring connector on top from reversing contactor assembly (note conductor cross-sections).

5) A mechanical interlock adapter, 3RA1954-2G, is required to use the standard 3RA1954-2A mechanical interlock for the AC version of the S6-S6-S3 WYE-Delta starter. The S6-S6-S3 WYE-Delta DC version would require a special custom build spacer, which is not manufactured, to allow the mechanical interlock to operate.

6) Only use wiring connector on the top from reversing contactor assembly (note conductor cross-sections); order WYE jumper in addition.

7) For overload relays >100A, see 3RB2 electronic Section 3, page 23.

Contactor assemblies for WYE-delta starting

Application

WYE-delta starting can only be used either if the motor normally operates in a Δ (delta) connection or starts softly or if the load torque during Y starting is low and does not increase sharply. On the Y step the motors can carry approximately 50 % (class KL 16) or 30 % (class KL 10) of their rated torque; the starting torque is approximately $^1/_3$ of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from Y to Δ must not be effected until the motor has run up to rated speed. Drives which require this changeover to be performed earlier are unsuitable for WYE-delta starting.

The ratings given in the above table are only applicable to motors with a starting current ratio of $I_A \leq 8.4 \times I_N$ and using either a 3RT19 16-2G or 3RT19 26-2G solid-state time-delay auxiliary switch block with a WYE-delta function or a 3RP1574 WYE-delta time-delay relay with a dead interval of approximately 50 ms on reversing.

For the circuit diagrams for the main and control circuits, see page 2/161. The size selected for the installation kits for WYE-delta starting is determined by the line contactor.

Design

Components for customer assembly

Installation kits with wiring connectors and, if necessary, mechanical connectors are available for contactor assemblies for WYE-delta starting. Contactors, overload relays, star-delta time-delay relays and auxiliary switches for the electrical interlock – if required also feeder terminals, mechanical interlocks [1]) and baseplates – must be ordered separately.

The wiring installation kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and WYE contactors (bottom).

In the case of sizes S2 to S12 only the bottom main conducting path connection between the delta and WYE contactors is included in the wiring connector, owing to the larger conductor cross-section at the infeed.

Motor protection

Overload relays or thermistor motor protection tripping units can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

Surge suppression

Sizes S00 to S3

All contactor assemblies can be fitted with RC elements, varistors or diode assemblies for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S0 to S3).

Sizes S6 to S12

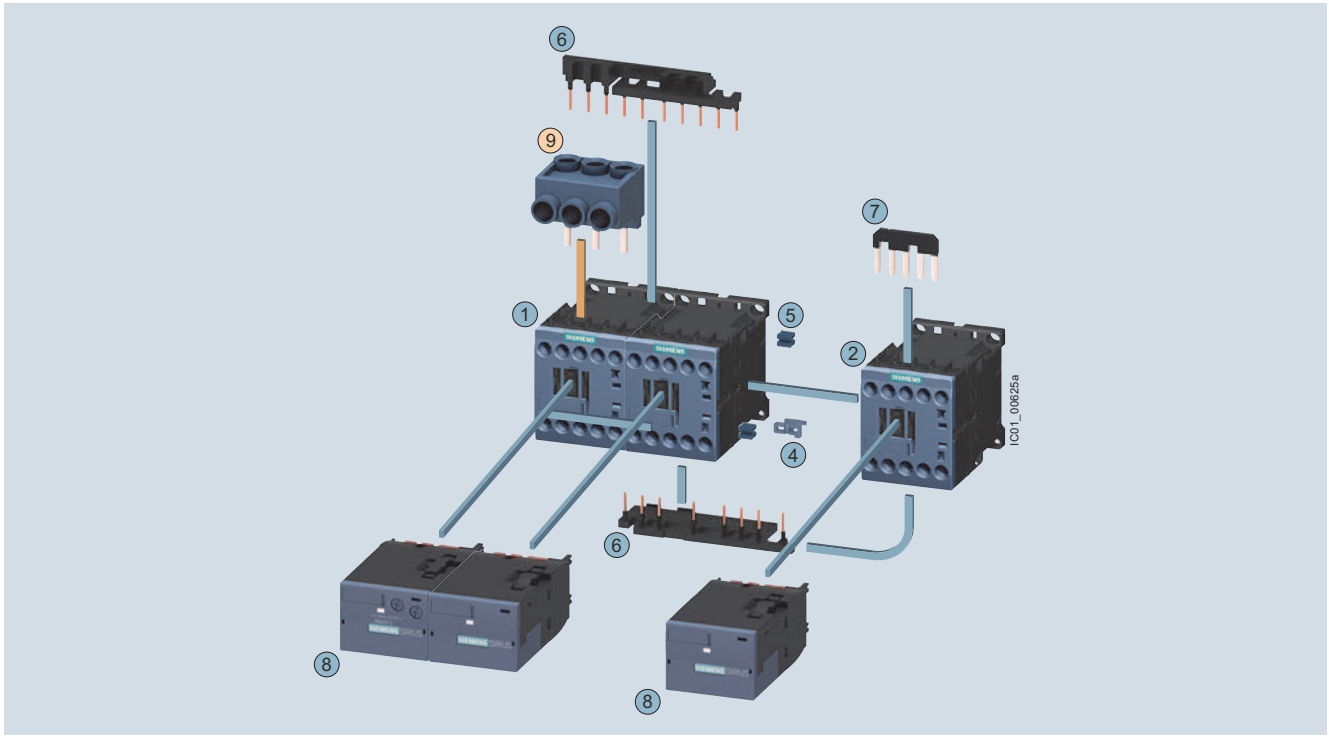
The contactors are fitted with varistors as standard.

1) Exception:
The mechanical interlock between the delta and WYE contactors is included in the installation kit for size S00 contactor assemblies.

Selection and ordering data

Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately	Type	Page
(9) Three-phase infeed terminal[1]	3RA2913-3K	2/85

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type Q11[2]	Type Q13	Type Q12	Page
(1)(2)(3)	Contactors, 5.5 kW	3RT2015	3RT2015	3RT2015	2/8
(1)(2)(3)	Contactors, 7.5 kW	3RT2017	3RT2017	3RT2015	2/8
(1)(2)(3)	Contactors, 11 kW	3RT2018	3RT2018	3RT2016	2/8
(4) ... (7)	Assembly kit S00-S00-S00 comprising:	3RA2913-2BB1			2/85
	(4) Mechanical interlock				
	(5) Four connecting clips for three contactors				
	(6) Wiring modules on top and bottom for connecting the main and auxiliary circuits				
	(7) Star jumper				
(8)	Function modules for star-delta (wye-delta) starting	3RA2816-0EW20			2/29

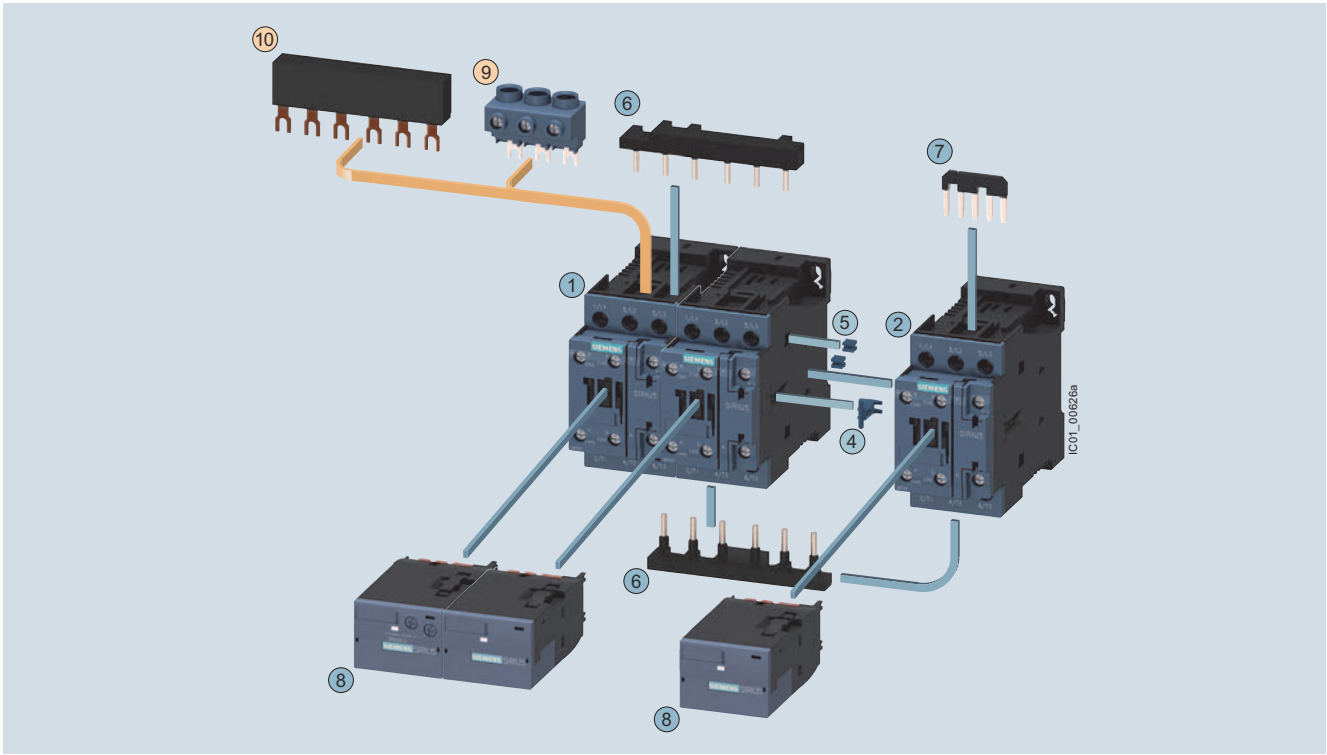
1) Part (9) can only be mounted in the case of contactors with screw terminal.
2) The version with 1 NO is required for momentary-contact operation.

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately	Type	Page
9 Three-phase infeed terminal[1)]	3RV2925-5AB	2/85
10 Three-phase busbar[1)]	3RV1915-1AB	1/8

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts	Type			Page
	Q11	Q13	Q12	
1 2 3 Contactors, 11 kW	3RT2024	3RT2024	3RT2024	2/8
1 2 3 Contactors, 15/18.5 kW	3RT2026	3RT2026	3RT2024	2/8
1 2 3 Contactors, 22 kW	3RT2027	3RT2027	3RT2026	2/8
4 ... 7 Assembly kit S0-S0-S0 comprising:	3RA2923-2BB1			2/85
4 Mechanical interlock				
5 Four connecting clips for three contactors				
6 Wiring modules on top and bottom for connecting the main and auxiliary circuits				
7 Star jumper				
8 Function modules for star-delta (wye-delta) starting	3RA2816-0EW20			2/29

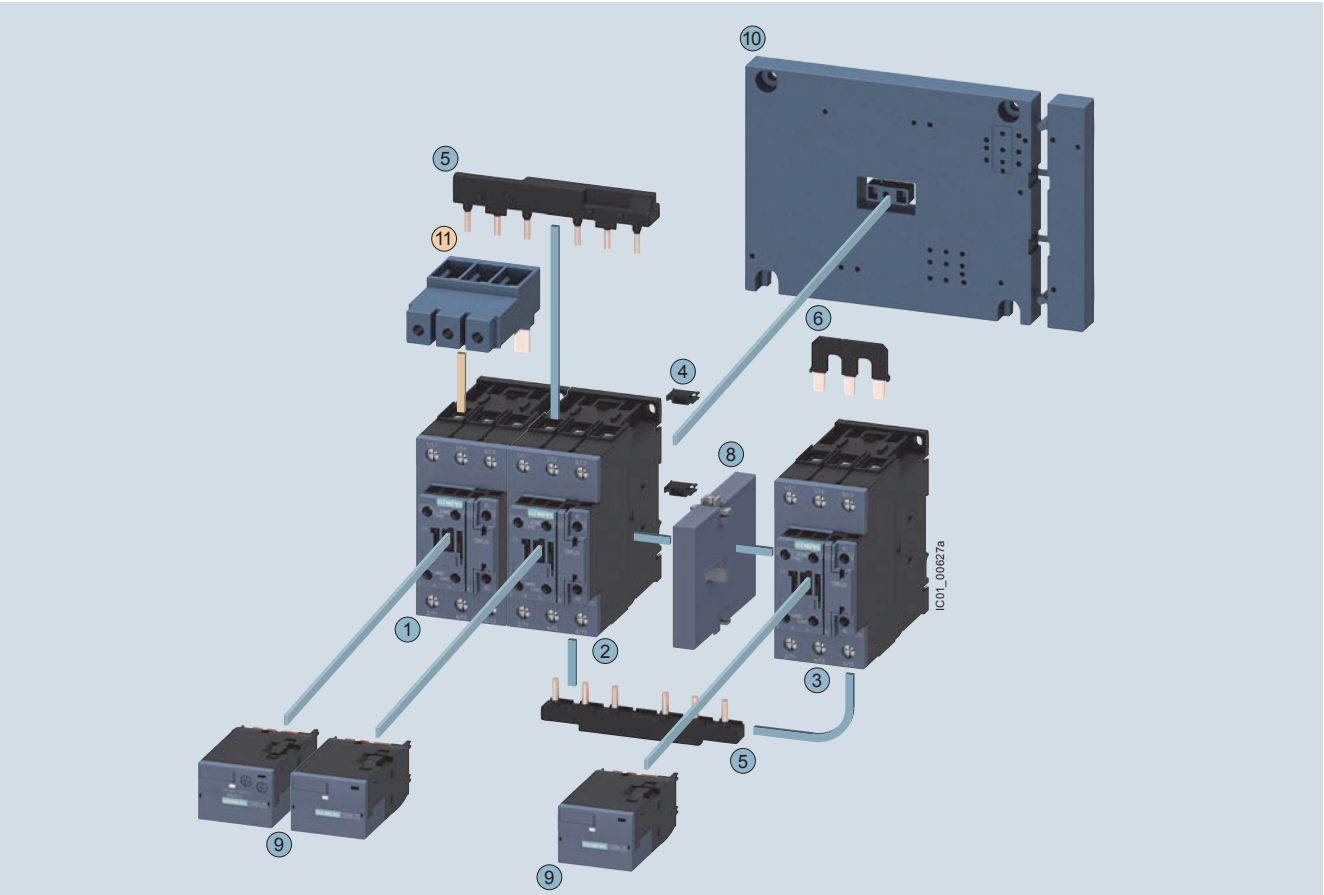
[1)] The parts 9 and 10 can only be mounted with contactors with screw terminal, the 6 wiring modules must be removed beforehand.

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

Size S2-S2-S0 · up to 65 A, 30 HP

The figure shows the version with screw terminals in S2-S2-S2



Mountable accessories (optional)

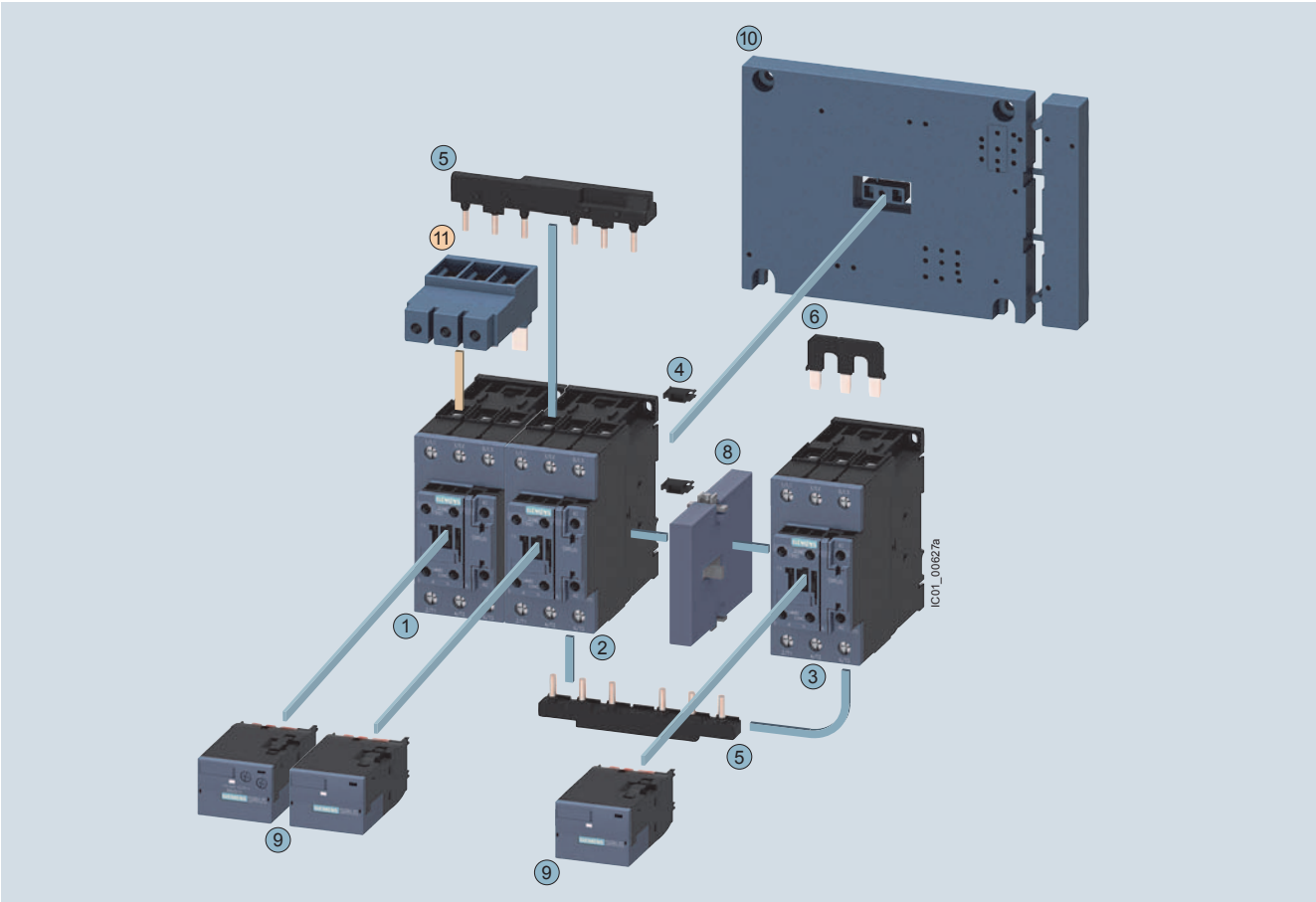
To be ordered separately	Type
11 Three-phase infeed terminal	3RV2935-5A

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type		
		Q11	Q13	Q12
1 2 3	Contactors, 22/30 kW	3RT2035	3RT2035	3RT2026
1 2 3	Contactors, 37 kW	3RT2035	3RT2035	3RT2027
1 2 3	Contactors, 45 kW	3RT2036	3RT2036	3RT2028
4 ... 7	Assembly kit S2-S2-S0 comprising:	3RA2933-2C		
	4 Four connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
	5 Wiring modules on top and bottom for connecting the main and auxiliary circuits			
	6 Star jumper S2			
	7 Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
8	Mechanical interlock	3RA2934-2B		
9	Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
10	Base plate star-delta (wye-delta)	3RA2932-2F		

For overview, see page 2/112.
For circuit diagrams, see page 2/202.

Size S2-S2-S2 · up to 86 A, 60 HP



Mountable accessories (optional)

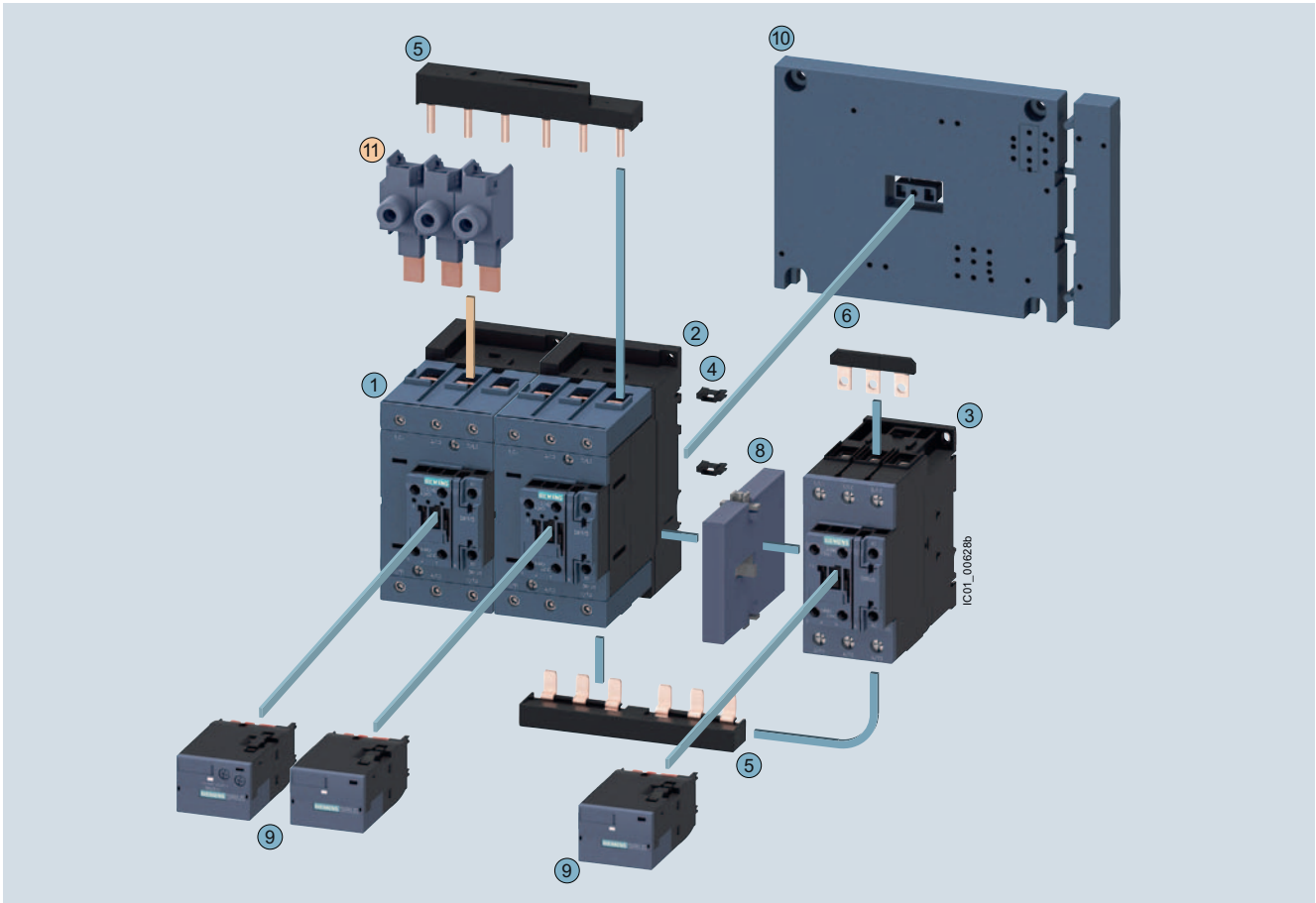
To be ordered separately	Type
11 Three-phase infeed terminal	3RV2935-5A

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type Q11	Q13	Q12
1 2 3	Contactors, 55 kW	3RT2037	3RT2037	3RT2035
4 ... 7	Assembly kit S2-S2-S2 comprising:	3RA2933-2BB1		
	4 Four connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
	5 Wiring modules on top and bottom for connecting the main and auxiliary circuits			
	6 Star jumper S2			
	7 Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
8	Mechanical interlock	3RA2934-2B		
9	Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
10	Base plate star-delta (wye-delta)	3RA2932-2F		

For overview, see page 2/112.
For circuit diagrams, see page 2/202.

Size S3-S3-S2 · up to 150 A, 100 HP



Mountable accessories (optional)

To be ordered separately	Type
(11) Single-phase infeed terminal (3 units are required)	3RA2943-3L

Complete contactor assembly for star-delta (wye-delta) starting

Individual parts		Type		
		Q11	Q13	Q12
(1)(2)(3)	Contactors, 55 kW	3RT2045	3RT2045	3RT2035
(1)(2)(3)	Contactors, 75 kW	3RT2045	3RT2045	3RT2036
(1)(2)(3)	Contactors, 90 kW	3RT2046	3RT2046	3RT2037
(4) ... (7)	Assembly kit S3-S3-S2 comprising:	3RA2943-2C		
	(4) Two connectors for three contactors (not required for fully pre-wired contactor assemblies for star-delta (wye-delta) starting)			
	(5) Wiring modules on top and bottom (S3-S2) for connecting the main and auxiliary circuits and a cable set for the auxiliary circuit			
	(6) Star jumper S2			
	(7) Cable for connecting the A2 coil contact from the line contactor with the A2 coil contact of the delta contactor (not shown in the drawing)			
(8)	Mechanical interlock	3RA2934-2B		
(9)	Function modules for star-delta (wye-delta) starting	3RA2816-0EW20		
(10)	Base plate star-delta (wye-delta)	3RA2942-2F		

[1] Contactor assembly for star-delta (wye-delta) starting for customer assembly in size S3-S3-S3 (not shown): The 3RA2943-2BB. assembly kit is to be used here, see page 3/106.

For overview, see page 2/112.
For circuit diagrams, see page 2/202.

AC and DC operation

IEC 60947, EN 60947.

The 3RH2 contactor relays have screw, ring lug terminal or spring-type terminals. Four contacts are available in the basic unit.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to EN 50274. The devices with ring lug terminal connection comply with degree of protection IP20 when fitted with the related terminal cover.

Contact reliability

High contact stability at low voltages and currents, suitable for solid-state circuits with currents ≥ 1 mA at a voltage of 17 V.

Surge suppression

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

Note:
The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Auxiliary switch blocks

The 3RH2 contactor relays can be expanded by up to four contacts by the addition of snap-on auxiliary switch blocks.

The auxiliary switch block can easily be snapped onto the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

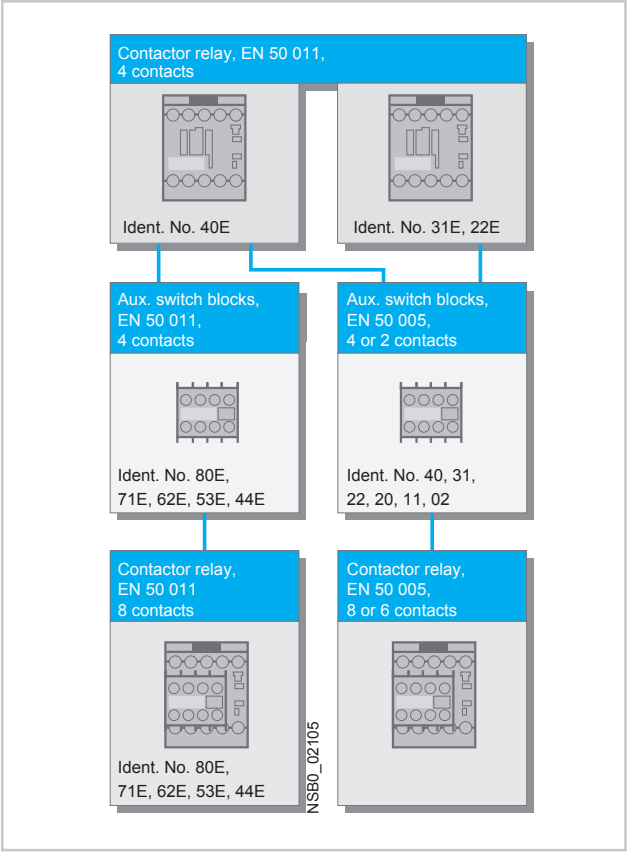
The contactor relays with 4 contacts according to EN 50011, with the identification number 40E, can be extended with 80E to 44E auxiliary switch blocks to obtain contactor relays with 8 contacts according to EN 50011. The identification numbers 80E to 44E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks (3RH29 11–1GA..) cannot be combined with contactor relays with identification numbers 31E and 22E; they are coded.

All contactor relays with 4 contacts according to EN 50011, identification numbers 40E to 22E, can be extended with auxiliary switch blocks 40 to 02 to obtain contactor relays with 6 or 8 contacts in accordance with EN 50005. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary switch blocks.

In addition, fully mounted 3RH22 8-pole contactor relays are available; the mounted 4-pole auxiliary switch block in the 2nd tier is not removable. The terminal designations are according to EN 50011.

These versions are built according to special Swiss regulations SUVA and are distinguished externally by a red labeling plate.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.



3RH24 latched control relays, size S00

Application

AC and DC operation

IEC 60 947, EN 60 947 (VDE 0660)

The terminal designations comply with EN 50 011.

The relay coil and the coil of the release solenoid are both designed for continuous duty.

The number of auxiliary contacts can be extended by means of auxiliary switch blocks (up to 4 poles).

RC elements, varistors, diodes or diode assemblies can be plugged onto both coils from the front for damping opening surges.

The control relay can also be switched on and released manually.

Design

EN 60 947-4-1
(VDE 0660 Part 102).

The 3TF contactors are suitable for use in any climate. They are safe from touch according to DIN VDE 0106 Part 100. Terminal covers (see accessories) may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Main contacts

Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be monitored in the closed position by means of three white double slides on the contactor base.

The vacuum interrupter must be replaced if the distance indicated by one of the double slides is less than 0.5 mm while the contactor is in the closed position.

It is advisable to replace all three interrupters in order to ensure maximum reliability.

Auxiliary contacts

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

Contact reliability

The auxiliary contacts are extremely reliable and as such are suitable for electronic circuits

- with currents ≥ 1 mA,
- at voltages greater than 17 V.

Surge suppression

Control circuit

Protection of the coil circuits against surges:

AC operation

- fitted with varistors as standard.

DC operation

Retrofitting options:

- varistors.

Electromagnetic compatibility (EMC)

3TF68/69..-.**C** contactors for AC operation are equipped with an electronically controlled solenoid mechanism with a high level of immunity to interference (see table opposite).

Note:
In operation in installations where it is not possible to observe the emitted interference limits, e.g. as an output contactor in static frequency changers, use of 3TF68/69..-.**Q** contactors (NS E catalogue, available in German) is recommended, without a main conductor path circuit (for further information refer also to the description below).

Contactor Type	Rated control supply voltage U_s	Overvoltage type (IEC 60 801)	Severity to IEC 60 801	Surge strength
3TF68 44-.C.., 3TF69 44-.C..	110 V ... 132 V	Burst Surge	3 4	2 kV 6 kV
	200 V ... 276 V	Burst Surge	4 4	4 kV 5 kV
	380 V ... 600 V	Burst Surge	4 4	4 kV 6 kV

Circuit of the main conducting paths

An integrated RC varistor circuit in the main conducting paths of the contactors damps the rate of rise of switching overvoltages to uncritical values. Multiple restriking of the switching arcs is thereby prevented.

The operator of an installation can thus assume that the danger to the motor winding arising from switching overvoltages with a high rate of rise is ruled out.

The contactors can therefore be used without reservation for all AC switching applications, including three-phase motors with the demanding AC-4 utilization category.

Important note

The surge suppression circuit is not necessary when 3TF68/69 contactors are used in circuits with e.g. d.c. choppers, frequency converters or variable-speed drives.

It might be damaged by the voltage peaks and harmonics generated. This may also cause phase-to-phase short-circuits in the contactors.

Remedy: Order the special contactor design without surge suppression. In this case the Order No. must be supplemented with **"-Z"** and the order code **"A02"**. No additional charge is made.

Short-circuit protection of contactors

For assembling fuseless load feeders, please select a circuit-breaker/contactor combination according to the brochure entitled "Verbraucherabzweige in sicherungsloser Bauweise", Order No. E20001-P285-A726 (available in German only).

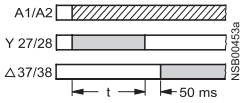
Solid-state, time-delay auxiliary switch box

The timer module, which is available in "ON-delay" and "OFF-delay" designs, allows time-delayed functions up to 100 s (3 distinct delay ranges).

It contains a relay with one NO contact and one NC contact; the relay is switched either after an ON-delay or after an OFF-delay.

The timer module with a WYE-DELTA function is equipped with one delayed and one instantaneous NO contact, with an interval time of 50 ms between the two (see diagram). The delay time of the NO contact can be set between 1.5 s and 30 s.

WYE-delta function



The contactor on which the solid-state, time-delay auxiliary switch block is mounted operates without a delay.

Size S00 (3RT201)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor. The timer module is supplied with power directly by plug-in contacts via the coil terminals of the contactor, in parallel with A1/A2. The time function is activated by closing the contactor on which the auxiliary switch block is mounted. The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay auxiliary switch block cannot be mounted on size S00 coupling relays.

Sizes S0 to S12 (3RT202 to 3RT107)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor.

The timer module is supplied with power via two terminals (A1/A2); the time delay of the auxiliary switch block can be activated either by a parallel link to any contactor coil or by any power source.

The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A single-pole auxiliary switch block can be snapped onto the front of the contactor in addition to the timer module.

The timer module has no integrated components for damping opening surges.

Solid-state time-delay block with semiconductor output

The timer module, which is available in "ON-delay" and "OFF-delay" with auxiliary power supply designs, allows time-delayed functions up to 100 s (3 distinct delay ranges). Contactors fitted with a time-delay block close or open after a delay according to the set time.

The ON-delay variant of the time-delay relay is connected in series with the contactor coil; terminal A1 of this coil must not be connected.

With the OFF-delay variant of the time-delay relay, the contactor coil is contacted directly via the relay; terminals A1 and A2 of the coil must not be connected.

The time-delay relays are suitable for both AC and DC operation.

Size S00 (3RT201)

The variant for size S00 contactors is fitted onto the front of the contactor (with the supply voltage switched off) and then slid into its latched position; at the same time, the time-delay relay is connected by means of plug-in contacts to coil terminals A1 and A2 of the contactor. Any contactor coil terminals which are not required are sealed off by means of covers on the enclosure of the time-delay block, to prevent them from being connected inadvertently (for circuit diagrams, see page 2/149).

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay block cannot be mounted on size S00 coupling relays.

Sizes S0 to S3 (3RT202 to 3RT107)

The time-delay block for size S0 to S3 contactors is plugged into coil terminals A1 and A2 on top of each contactor; the time-delay relay is connected both electrically and mechanically by means of pins.

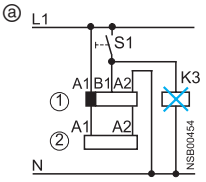
A varistor is integrated in the timer module for damping opening surges in the contactor coil.

Configuration note

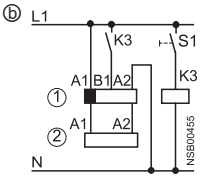
Activation of loads parallel to the start input is not permitted with AC operation (see ⓐ).

The 3RT19 16-2D .../3RT19 26-2D ... time-delay blocks with an OFF delay have a voltage-carrying start input B1. This means that if there is a parallel load on terminal B1, activation can be simulated with AC voltage. In this case, the additional load (e. g. contactor K3) must be wired as shown in ⓑ.

ⓐ



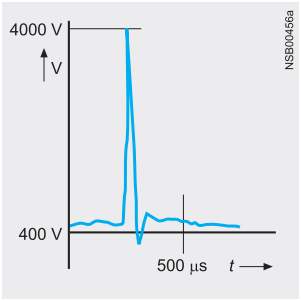
ⓑ



Time-delay block
Contactor

3-phase EMC interference suppression module for size S00 contactor

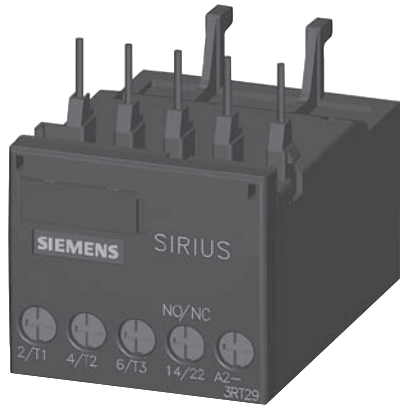
A so-called backr-e.m.f. (electromotive force) is produced when motors or various inductive loads are turned off. Voltage peaks of up to 4 000 V may occur as a result, with a frequency spectrum from 1 kHz to 10 MHz and a rate of voltage variation from 0.1 to 20 V/ns.

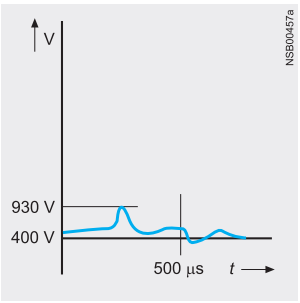


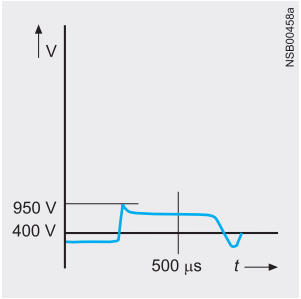
The connection between the main conducting path and the EMC interference suppression module enables contact arcing, which is responsible for contact erosion and the majority of clicking noises, to be reduced; this in turn is conducive to an electromagnetically compatible design.

Since the EMC interference suppression module achieves a significant reduction in radio-frequency components and the voltage level in three phases, the contact endurance is also improved considerably. This makes an important contribution towards enhancing the reliability and availability of the system as a whole.

There is no need for fine graduations within each performance class, as smaller motors inherently have a higher inductance, so that one solution for all fixed-speed drives up to 7.5 HP is adequate.







Two electrical variants are available:

The advantages of the RC circuit lie mainly in the reduction in the rate of rise and in its RF damping ability. The selected values ensure effective interference suppression over a wide range.

The varistor circuit is able to absorb high energy levels and is also suitable for frequencies from 10 to 400 Hz (variable-speed drives). There is no limiting below the knee-point voltage, however.

OFF-delay device for size S00 to S3 contactors

AC and DC operation

IEC 60 947, EN 60 947

For screwing and snapping onto 35 mm standard mounting rail. The OFF-delay devices have screw connections.

Application

The OFF-delay device prevents a contactor from dropping out unintentionally when there is a short-time voltage dip or voltage failure. It supplies the necessary power for a series-connected, DC-operated contactor during a voltage dip to ensure that the contactor does not open. The 3RT19 16/3RT29 16 OFF-delay devices are specifically designed for operation with the 3RT contactors and 3RH contactor relays of the SIRIUS series.

Principle of operation

The OFF-delay device operates without external voltage on a capacitive basis, and can be energized with either AC or DC (24 V version for DC operation only). Voltage matching, which is only necessary with AC operation, is performed using a rectifier bridge.

A contactor opens after a delay when the capacitors of the contactor coil, built into the OFF-delay device, are switched in parallel. In the event of voltage failures, the capacitors are discharged via the coil and thereby delay the opening of the contactor.

If the command devices are upstream of the OFF-delay device in the circuit, the OFF delay takes effect with every opening operation. If the opening operation is downstream of the OFF-delay device, an OFF delay only applies in the event of failure of the mains voltage.

Operation

In the case of the versions for rated control supply voltages of 110 V and 230 V, either AC voltage or DC voltage can be applied on the line side, where as the variant for 24 V is designed for DC operation only.

A DC-operated contactor is connected to the output in accordance with the input voltage that is applied.

The mean value of the OFF delay is approximately 1.5 times the specified minimum time.

Interface for mounting on size S0 to S3 contactors

Application

DC operation

IEC 60 947 and EN 60 947

The interface is suitable for use in any climate. It is safe from touch to DIN VDE 0106 Part 100. The terminal designations conform to EN 50 005.

Functions

Design

System-compatible operation with DC 24 V, coil voltage tolerance 17 V to 30 V.

Low power consumption in conformity with the technical data of the electronic systems.
A light-emitting diode indicates the circuit state.

Surge suppression

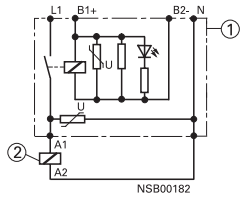
The 3RH29 24-1GP11 interface has an integrated surge suppressor (varistor) for the contactor coil being switched.

Mounting

The 3RH29 24-1GP11 interface is mounted directly on the contactor coil.

Terminal diagram

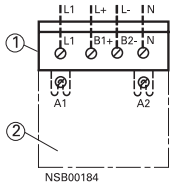
3RH19/29 24-1GP1
with surge suppression



①Interface
②Contactor

Connection example

3RH19/29 24-1GP1
with surge suppression



①Interface
②Contactor

More information

Contactors	Type Size Width		mm	3RT2 S00 and S0 45
Rated data of the auxiliary contacts				
According to IEC 60947-5-1/EN 60947-5-1 The data apply to integrated auxiliary contacts and contacts in the auxiliary switch blocks for contactor sizes S00 to S0[1)]				
Rated insulation voltage U_i (pollution degree 3)			V	690
Conventional thermal current I_{th} = Rated operational current I_e/AC-12			A	10
AC load				
Rated operational current I_e/AC-15/AC-14				
• For rated operational voltage U_e	24 V	A		10[1)]
	110 V	A		10[1)]
	125 V	A		10[1)]
	220 V	A		10[1)]
	230 V	A		10[1)]
	380 V	A		3
	400 V	A		3
	500 V	A		2
	660 V	A		1
	690 V	A		1
DC load				
Rated operational current I_e/DC-12				
• For rated operational voltage U_e	24 V	A		6
	60 V	A		6
	110 V	A		3
	125 V	A		2
	220 V	A		1
	440 V	A		0.3
	600 V	A		0.15
Rated operational current I_e/DC-13				
• For rated operational voltage U_e	24 V	A		6
	60 V	A		2
	110 V	A		1
	125 V	A		0.9
	220 V	A		0.3
	440 V	A		0.14
	600 V	A		0.1
Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4				Frequency of contact faults $<10^{-8}$ i. e. <1 fault per 100 million operating cycles

Endurance of the auxiliary contacts

It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The contact endurance is mainly dependent on the breaking current.

The characteristic curves apply to:
- Integrated auxiliary contacts on 3RT20
- Auxiliary switch blocks 3RH 29 11, 3RH29 21 for contactors size S00 and S0.

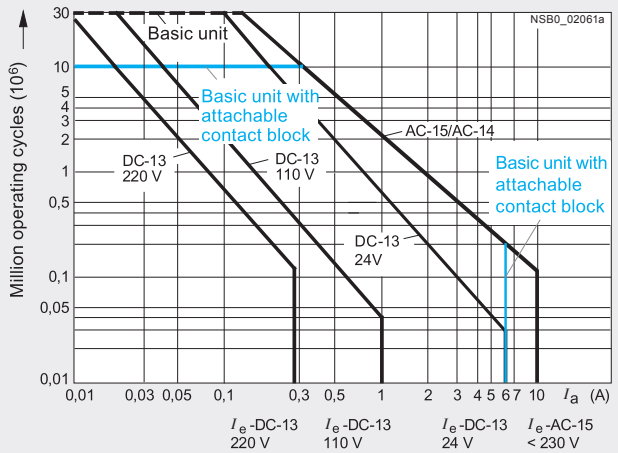


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

[1)] Integrated auxiliary contacts in size S0, auxiliary switches for snapping onto the front and for mounting onto the side in size S00 and S0: I_e = 6 A at AC-14/AC-15.

Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The rated operational current I_e complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e/AC-4 can be increased. I_e

If the contacts are used for mixed operation, i. e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

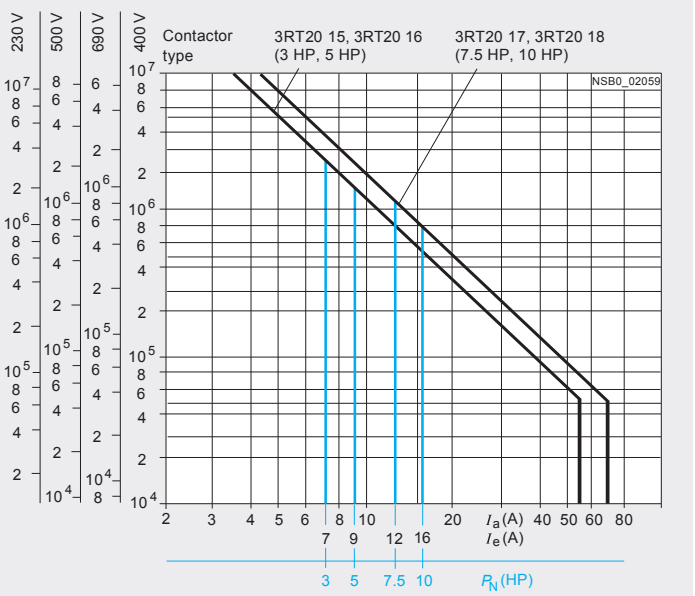
$$X = \frac{A}{1 + \frac{C}{100}\left(\frac{A}{B} - 1\right)}$$

Characters in the equation:

- X Contact endurance for mixed operation in operating cycles
- A Contact endurance for normal operation ($I_a = I_e$) in operating cycles
- B Contact endurance for inching (I_a = multiple of I_e) in operating cycles
- C Inching operations as a percentage of total switching operations

Size S00

Operating cycles at



Size S0

Operating cycles at

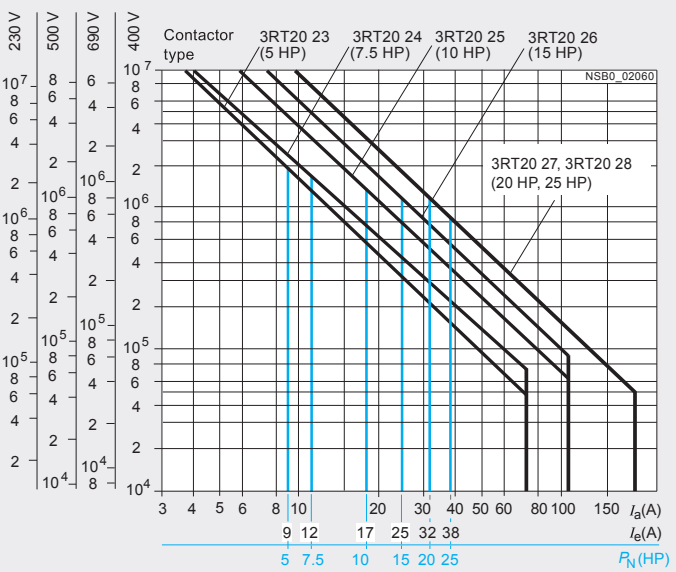
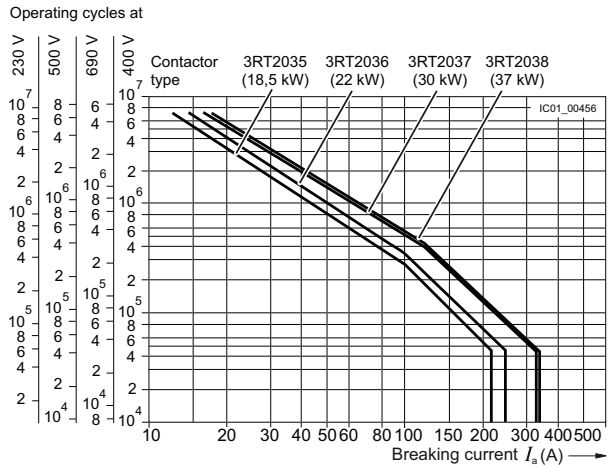


Diagram legend:
P_N= Rated power for squirrel-cage motors at 460 V
I_a = Breaking current
I_e = Rated operational current

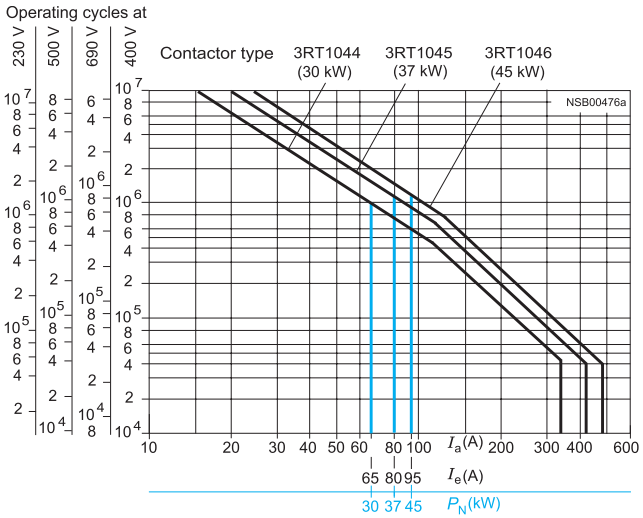
Technical data

Endurance of the main contacts

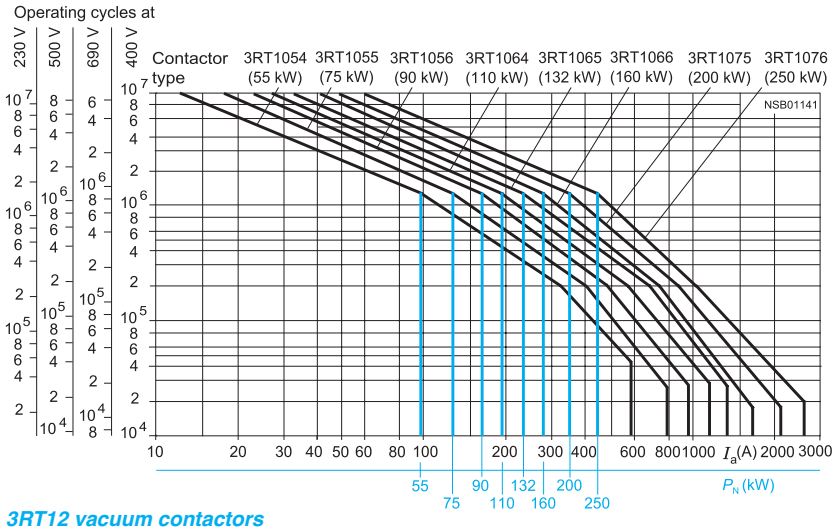
Size S2



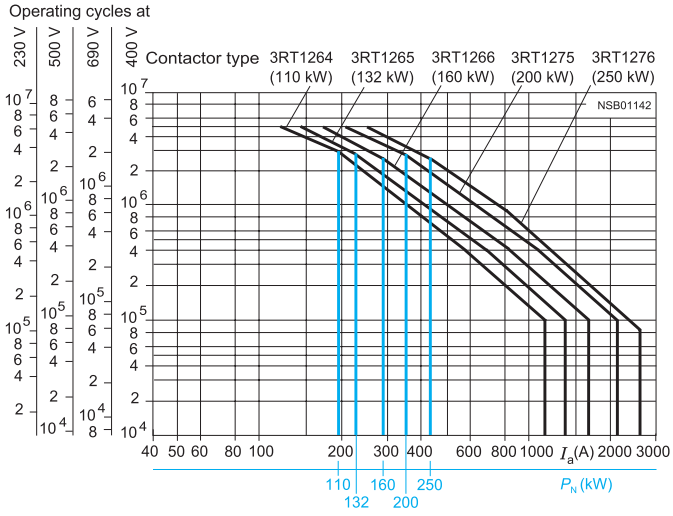
Size S3



Sizes S6 to S12



3RT12 vacuum contactors Sizes S10 and S12



Legend:
P_N = Ratings of three-phase motors with squirrel-cage rotor at 400 V
I_a = Breaking current
I_e = Rated operational current

Contactors	Type			3RT20 15	3RT20 16	3RT20 17	3RT20 18
	Size			S00	S00	S00	S00
	Width		mm	45	45	45	45
cULus and cULus rated data							
Rated insulation voltage			V AC	600			
Uninterrupted current, at 40 °C	• Open and enclosed		A	20			
Maximum horsepower ratings (cULus and cULus approved values)							
• Rated power for induction motors at 60 Hz		At 200 V	hp	1.5	2	3	3
		230 V	hp	2	3	3	5
		460 V	hp	3	5	7.5	10
		575 V	hp	5	7.5	10	10
Short-circuit protection[1] (contactor or overload relay)		At 600 V	kA	5	5	5	5
	• Fuse CLASS J[2]		A	40	40	40	40
	• Circuit breakers with overload protection according to UL 489		A	50	50	50	50
• Combination motor controllers type E according to UL 508				--[3]	--[3]	--[3]	--[3]
NEMA/EEMAC ratings							
NEMA/EEMAC size				--			0
• Uninterrupted current	- Open		A	--			18
	- Enclosed		A	--			18
• Rated power for induction motors at 60 Hz		At 200 V	hp	--			3
		230 V	hp	--			3
		460 V	hp	--			5
		575 V	hp	--			5
Overload relays	• Type			3RU21 1	/ 3RB30 1		
	• Setting range		A	0.11 ... 16	/ 0.1 ... 16		

Contactors	Type			3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size			S0	S0	S0	S0	S0	S0
	Width		mm	45	45	45	45	45	45
cULus and cULus rated data									
Rated insulation voltage			V AC	600				600	
Uninterrupted current, at 40 °C	• Open and enclosed		A	35				42	
Maximum horsepower ratings (cULus and cULus approved values)									
• Rated power for induction motors at 60 Hz		At 200 V	hp	2	3	5	7.5	10	10
		230 V	hp	3	3	5	7.5	10	10
		460 V	hp	5	7.5	10	15	20	25
		575 V	hp	7.5	10	15	20	25	25
Short-circuit protection[1] (contactor or overload relay)		At 600 V	kA	5	5	5	5	5	5
	• Fuse CLASS J[2]		A	45	45	45	70	110	110
	• Circuit breakers with overload protection according to UL 489		A	70	70	70	100	100	100
• Combination motor controllers type E according to UL 508									
	- At 480 V		Type	3RV20 2					
			A	--					
			kA	--[3]					
	- At 600 V		Type	3RV20 2					
			A	--					
			kA	--[3]					
NEMA/EEMAC ratings									
NEMA/EEMAC size				--				1	
• Uninterrupted current	- Open		A	--				27	
	- Enclosed		A	--				27	
• Rated power for induction motors at 60 Hz		At 200 V	hp	--				7.5	
		230 V	hp	--				7.5	
		460 V	hp	--				10	
		575 V	hp	--				10	
Overload relays	• Type			3RU21 2	/ 3RB30 2				
	• Setting range		A	1.8 ... 40	/ 0.1 ... 40				

[1] For more information about short-circuit values, e. g. for protection against short-circuit currents, see UL reports (http://support.automation.siemens.com) for the individual devices.
[2] Values for RK5 fuses on request.
[3] Values on request.

cULus and cULus ratings of the contactors

Contactor	Size Type		S2 3RT20 35	S2 3RT20 36	S2 3RT20 37	S2 3RT20 38	S3 3RT20 45	S3 3RT20 46	S3 3RT20 47
Rated Insulation Voltage		AC V	600				600		
Continuous current, at 40 °C Free air and enclosed		A	55	60	80	90	90	105	
Maximum horsepower ratings	Ratings at 115 V single at 230 V phase motors at 50/60 Hz	hp hp	3 7.5	3 10	5 10	5 15	5 15	7.5 15	10 -
cULus and cULus approved values									
Ratings of three-phase motors at 50/60 Hz	at 200 V 230 V 460 V 575 V	hp hp hp hp	10 15 30 40	15 15 40 50	20 20 50 50	20 25 50 60	20 25 50 60	25 30 60 75	30 30 75 100
Short-circuit protection	Fuse or circuit- breaker acc. to UL 489	kA A A	5 150 150	10 200 200	10 250 200	10 250 200	5 250 250	10 300 300	10 350 400
NEMA/EEMAC ratings Conventional thermal current	NEMA/EEMAC Size Free air Enclosed	 A A	 - -	2 45 45	 - -	 	 - -	 	3 90 90
Ratings of three-phase motors at 60 Hz	at 200 V 230 V 460 V 575 V	hp hp hp hp	- - - -	10 15 25 25	- - - -	 	- - - -	 	25 30 50 50
Overload Relay	Type Setting Range	A	3RU213 / 3RB303 11 … 80 / 12 … 80				3RU11 4 18 … 100		
Contactor Size			S00 - S0 Screw and Spring connection Integrated or snap-on aux. switch block		Screw and Spring connection Laterally mountable aux. switch block		S2 - S12 Screw and Spring connection Single pole and 4-pole Snap-on aux. switch block		Screw and Spring con- nection Laterally mountable aux. switch block

cULus and cULus ratings of the auxilary contactors

Rated Voltage		AC	600	600	600	600
Switching Capacity **Uninterrupted current**	At 240 VAC	A	A 600, P 600 10	A 600, Q 600 10	A 600, P 300 10	A 300, Q 300 10

Technical data

Contactor	Size Type			S6 3RT10 54	S6 3RT10 55	S6 3RT10 56	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
cULus ratings of the contactors									
Rated insulation voltage			AC V	600			600		
Continuous current, at 40 °C	Free air and enclosed		A	140	195	195	250	330	330
Maximum horsepower ratings (cULus-approved values)	Ratings single phase motors at 50/60 Hz	at 115 V 230 V	HP	25	30	30			
Ratings of three-phase motors at 50/60 Hz		200 V	HP	40	50	60	60	75	100
		230 V	HP	50	60	75	75	100	125
		460 V	HP	100	125	150	150	200	250
		575 V	HP	125	150	200	200	250	300
Short-circuit protection			kA	10	10	10	10	18	18
	CLASS RK5 fuse		A	450	500	500	700	800	800
	Circuit-breaker acc. to UL 489		A	350	450	500	500	700	800
NEMA/EEMAC ratings	NEMA/EEMAC SIZE			–	4	–	–	–	5
Conventional thermal current	Free air		A	–	150	–	–	–	300
	Enclosed		A	–	135	–	–	–	270
Ratings of three-phase motors at 60 Hz		at 200 V	HP	–	40	–	–	–	75
		230 V	HP	–	50	–	–	–	100
		460 V	HP	–	100	–	–	–	200
		575 V	HP	–	100	–	–	–	200
Overload relay	Type			3RB20 56			3RB20 66		

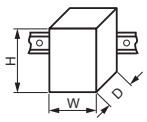
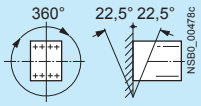
Contactor	Size Type			S12 3RT10 75	S12 3RT10 76
Rated insulation voltage			AC V	600	
Continuous current, at 40 °C	Free air and enclosed		A	400	540
Maximum horsepower ratings (cULus-approved values)					
Ratings of three-phase motors at 50/60 Hz		at 200 V	HP	125	150
		230 V	HP	150	200
		460 V	HP	300	400
		575 V	HP	400	500
Short-circuit protection			kA	18	30
	CLASS RK5 fuse		A	1000	1200
	Circuit-breaker acc. to UL 489		A	900	900
NEMA/EEMAC ratings	NEMA/EEMAC SIZE			–	6
Conventional thermal current	Free air		A	–	600
	Enclosed		A	–	540
Ratings of three-phase motors at 60 Hz		at 200 V	HP	–	150
		230 V	HP	–	200
		460 V	HP	–	400
		575 V	HP	–	400
Overload relay	Type			3RB20 66	

Technical data

Contactor	Size / Type			S10 3RT12 64	S10 3RT12 65	S10 3RT12 66	S12 3RT12 75	S12 3RT12 76
cULus ratings of the contactors								
Rated insulation voltage			AC V	600			600	
Continuous current, at 40 °C	Free air and enclosed		A	330			540	
Maximum horsepower ratings (cULus-approved values)								
Ratings of three-phase motors at 50/60 Hz		at 200 V	HP	60	75	100	125	150
		230 V	HP	75	100	125	150	200
		460 V	HP	150	200	250	300	400
		575 V	HP	200	250	300	400	500
Short-circuit protection			kA	10	18	18	18	30
	CLASS RK5 fuse		A	700	800	800	1200	1200
	Circuit-breaker acc. to UL 489		A	500	700	900	1000	1200
NEMA/EEMAC ratings	NEMA/EEMAC SIZE			–		5	–	6
Conventional thermal current	Free air		A	–			–	
	Enclosed		A	–			–	
Ratings of three-phase motors at 60 Hz		at 200 V	HP	–			–	
		230 V	HP	–			–	
		460 V	HP	–			–	
		575 V	HP	–			–	
Overload relay	Type			3RB20 66			3RB20 66	

Contactor	Size / Type		S3 3RT14 46	S6 3RT14 56	S10 3RT14 66	S12 3RT14 76
Rated insulation voltage		AC V	600			
Maximum UL resistive load ratings		A	110	210	360	580

Contactor	Size / Type	S00 3RT23 15	S00 3RT23 16	S00 3RT23 17	S0 3RT23 24	S0 3RT23 25	S0 3RT23 26	S0 3RT23 27	S2 3RT23 36	S3 3RT13 44	S3 3RT13 46
Rated insulation voltage	AC V	600									
Maximum UL resistive load ratings	A	16	18	20	30	30	35	42	60	100	110

Type			3RT20 15, 3RT20 16	3RT20 17, 3RT20 18
Size			S00	S00
Dimensions (W x H x D)[1]		mm	45 x 57.5 x 73 / 45 x 70 x 73	
• With mounted auxiliary switch block		mm	45 x 57.5 x 116 / 45 x 70 x 121	
• With mounted function block		mm	45 x 57.5 x 142 / 45 x 70 x 142	
General data				
Permissible mounting positions The contactors are designed for operation on a vertical mounting surface.		AC and DC operation		
Upright mounting position		AC and DC operation	 Special design required. Positions 13 to 16 of the Order No. must be changed to **-1AA0**. Additional charge.	
Mechanical endurance				
• Basic unit		Operating cycles	30 million	
• Basic unit with snap-on auxiliary switch block		Operating cycles	10 million	
• Solid-state compatible auxiliary switch block		Operat. cycles	5 million	
Electrical endurance			2)	
Rated insulation voltage U_i (pollution degree 3)		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400	
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.				
• 3RT20 1., 3RT23 1. (removable auxiliary switch block)			Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block acc. to EN 60947-4-1, Appendix F	
• 3RT20 1., 3RT23 1. (permanently mounted auxiliary switch block)			Yes, acc. to EN 60947-4-1, Appendix F	
• 3RH29 19-.NF.. solid-state compatible auxiliary switch blocks have no mirror contacts.				
Ambient temperature				
• During operation		°C	-25 ... +60	
• During storage		°C	-55 ... +80	
Degree of protection acc. to EN 60947-1, Appendix C			IP20, coil assembly IP40	
Touch protection acc.to EN 50274			Finger-safe	
Shock resistance rectangular pulse				
• AC operation		g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
• DC operation		g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
Shock resistance sine pulse				
• AC operation		g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10
• DC operation		g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10
Conductor cross-sections			3)	
Short-circuit protection for contactors without overload relays				
			For short-circuit protection for contactors with overload relays see Section 3: Overload Relays For short-circuit protection for fuseless load feeders see Section 4: Combination Starters	
Main circuit				
• Fuse links, operational class gG : NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1				
- Type of coordination "1"		A	35	50
- Type of coordination "2"		A	20	25
- Weld-free[4]		A	10	10
• Miniature circuit breakers (up to 230 V) with C characteristic Short-circuit current 1 kA, type of coordination "1"		A	10	10
Auxiliary circuit				
• Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)		A	10	
• Miniature circuit breakers up to 230 V with C characteristic Short-circuit current $I_k < 400$ A		A	6	

1) Dimensions for devices with screw terminals / spring-type terminals.
2) For endurance of the main contacts see page 2/124.
3) For conductor cross-sections see page 2/132 .
4) Test conditions according to IEC 60947-4-1.

Contactors	Type Size Width		mm	3RT20 15, 3RT20 16 S00 45	3RT20 17, 3RT20 18 S00 45
Control					
Solenoid coil operating range					
• AC operation		50 Hz 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s	
• DC operation		Up to 50 °C Up to 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)					
• AC operation, 50/60 Hz, standard version	- Closing - P.f. - Closed - P.f.		VA VA 	27/24.3 0.8/0.75 4.2/3.3 0.25/0.25	37/33 0.8/0.75 5.7/4.4 0.25/0.25
• AC operation, 50 Hz, USA/Canada	- Closing - P.f. for closing - Closed - P.f. for closed		VA VA 	26.4 0.81 4.4 0.24	36 0.8 5.9 0.24
• AC operation, 60 Hz, USA/Canada	- Closing - P.f. for closing - Closed - P.f. for closed		VA VA 	31.7 0.81 4.8 0.25	43 0.8 6.5 0.25
• DC operation	Closing = Closed		W	4	4
Permissible residual current of the electronics (with 0 signal)					
	• AC operation			<3 mA x (230 V/U_s)[1]	<4 mA x (230 V/U_s)[1]
	• DC operation			<10 mA x (24 V/U_s)[1]	
Operating times[2]					
Total break time = Opening delay + Arcing time					
• AC operation at 0.8 ... 1.1 x U_s	- Closing delay - Opening delay		ms ms	9 ... 35 3.5 ... 14	8 ... 33 4 ... 15
• DC operation at 0.85 ... 1.1 x U_s	- Closing delay - Opening delay		ms ms	30 ... 100 7 ... 13	30 ... 100 7 ... 13
• Arcing time			ms	10 ... 15	10 ... 15
Operating times for 1.0 x U_s[2]					
• AC operation	- Closing delay - Opening delay		ms ms	9.5 ... 24 4 ... 14	9 ... 22 4.5 ... 15
• DC operation	- Closing delay - Opening delay		ms ms	35 ... 50 7 ... 12	35 ... 50 7 ... 12

[1] The 3RT29 16-1GA00 additional load module is recommended for higher residual currents.

[2] The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Contactors	Type Size			3RT20 15 S00	3RT20 16 S00	3RT20 17 S00	3RT20 18 S00
Main circuit							
AC capacity							
Utilization category AC-1 **Switching resistive loads**							
• Rated operational current I_e	At 40 °C up to 690 V At 60 °C up to 690 V		A A	18 16	22 20	22 20	22 20
• Rated power for AC loads[1] P.f.= 0.95 (at 60 °C)	230 V 400 V 500 V 690 V		kW kW kW kW	6.3 11 13.8 19	7.5 13 17 22	7.5 13 17 22	7.5 13 17 22
• Minimum conductor cross-section for loads with I_e	At 40 °C At 60 °C		mm^2 mm^2	2.5 2.5	2.5 2.5	2.5 2.5	2.5 2.5
Utilization category AC-3							
• Rated operational currents I_e	Up to 400 V 440 V 500 V 690 V		A A A A	7 7 6 4.9	9 9 7.7 6.7	12 11 9.2 6.7	16 15 12.4 8.8
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 200 V 230 V 460 V 575 V		HP HP HP HP	1.5 2 3 5	2 3 5 7.5	3 3 7.5 10	3 5 10 10
Thermal load capacity	10 s current[2]		A	56	72	96	128

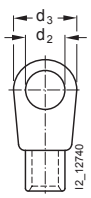
[1] Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

[2] According to IEC 60947-4-1.
For rated values for various start-up conditions see Section 3 --> "Overload Relays".

Contactors Type Size Width		mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Main circuit						
AC capacity						
Power loss per conducting path	At I_e/AC-3	W	0.42	0.7	1.24	2.2
Utilization category AC-4 (for I_a = 6 x I_e)[1]						
• Rated operational current I_e	Up to 400 V	A	6.5	8.5	8.5	11.5
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	Up to 400 V	kW	3	4	4	5.5
• The following applies to a contact endurance of about 200000 operating cycles:						
- Rated operational currents I_e	Up to 400 V	A	2.6	4.1	4.1	5.5
	690 V	A	1.8	3.3	3.3	4.4
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	0.67	1.1	1.1	1.5
	400 V	kW	1.15	2	2	2.5
	500 V	kW	1.45	2	2	3
	690 V	kW	1.15	2.5	2.5	3.5
Switching frequency						
Switching frequency z in operating cycles/hour						
• Contactors without overload relays	No-load switching frequency AC	h^{-1}	10000			
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400\ V/U')^{1.5} \cdot 1/h$	No-load switching frequency DC	h^{-1}	10000			
	Rated operation					
	AC-1 (AC/DC)	h^{-1}	1000			
	AC-2 (AC/DC)	h^{-1}	750			
	AC-3 (AC/DC)	h^{-1}	750			
	AC-4 (AC/DC)	h^{-1}	250			
• Contactors with overload relays (mean value)		h^{-1}	15			

[1] The data only apply to 3RT25 16 and 3RT25 17 (2 NO + 2 NC) up to a rated operational voltage of 400 V.

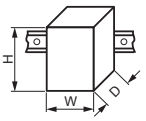
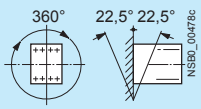
Contactors Type Size	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Conductor cross-sections					
Main conductors and auxiliary conductors (1 or 2 conductors can be connected)		**Screw terminals**			
• Solid	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947; max. 2 x (0.5 ... 4)			
• Finely stranded with end sleeve	mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]			
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]; 2 x 12			
• Terminal screw		M3 (for standard screwdriver size 2 and Pozidriv 2)			
• Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			
Main conductors, auxiliary conductors and coil terminals (1 or 2 conductors can be connected)		**Spring-type terminals**			
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5			
• Solid	mm^2	2 x (0.5 ... 4)			
• Finely stranded with end sleeve	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)			
Auxiliary conductors for front and laterally mounted auxiliary switches (1 or 2 conductors can be connected)					
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5			
• Solid	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve	mm^2	2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			
Main conductors and auxiliary conductors		**Ring lug terminal connection**			
• Terminal screw		M3, Pozidriv 2			
• Operating devices	mm	Ø 5 ... 6			
• Tightening torque	Nm	0.8 ... 1.2			
• Usable ring terminal lugs	mm	d_2 = min. 3.2			
- DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve	mm	d_3 = max. 7.5			



For tool for opening the spring-type terminals (see Accessories on page 2/81).
Maximum external diameter of the conductor insulation: 3.6 mm.

An "insulation stop" must be used for conductor cross-sections ≤ 1 mm^2 (see Accessories on page 2/81).

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Type			**3RT20 23**	**3RT20 24**	**3RT20 25**	**3RT20 26**	**3RT20 27**	**3RT20 28**
Size			**S0**	**S0**	**S0**	**S0**	**S0**	**S0**
Dimensions (W x H x D) for AC operation[1]		mm	45 x 85 x 97 / 45 x 101.5 x 97					
• With mounted auxiliary switch block		mm	45 x 85 x 141 / 45 x 101.5 x 144					
• With mounted function block			45 x 85 x 166 / 45 x 101.5 x 166					
Dimensions (W x H x D) for DC operation[1]		mm	45 x 85 x 107 / 45 x 101.5 x 107					
• With mounted auxiliary switch block		mm	45 x 85 x 151 / 45 x 101.5 x 154					
• With mounted function block			45 x 85 x 176 / 45 x 101.5 x 176					
General data								
Permissible mounting positions								
The contactors are designed for operation on a vertical mounting surface.								
Upright mounting position								
	 AC and D operation		Special version required, also applies to 3RT20 2.-.K.40. coupling relays.					
Mechanical endurance								
• Basic unit		Operating cycles	10 million					
• Basic unit with snap-on auxiliary switch block		Operating cycles	10 million					
• Solid-state compatible auxiliary switch block		Operat. cycles	5 million					
Electrical endurance			[2]					
Rated insulation voltage U_i (pollution degree 3)		V	690					
Rated impulse withstand voltage U_{imp}		kV	6					
Protective separation between the coil and the main contacts (acc. to EN 60947-1, Appendix N)		V	400					
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.								
• 3RT20 2., 3RT23 2. (removable auxiliary switch block)			Yes, acc. to EN 60947-4-1, Appendix F					
• 3RT20 2., 3RT23 2. (permanently mounted auxiliary switch block)			Yes, acc. to EN 60947-4-1, Appendix F					
Permissible ambient temperature								
• During operation		°C	-25 ... +60					
• During storage		°C	-55 ... +80					
Degree of protection acc. to EN 60947-1, Appendix C			IP20, coil assembly IP20					
Touch protection acc.to EN 50274			Finger-safe					
Shock resistance rectangular pulse								
• AC operation		g/ms	7.5/5 and 4.7/10			8.3/5 and 5.310		
• DC operation		g/ms	>10/5 and 7.5/10			>10/5 and 7.5/10		
Shock resistance sine pulse								
• AC operation		g/ms	11.8/5 and 7.4/10			13.5/5 and 8.3/10		
• DC operation		g/ms	>15/5 and >10/10			>15/5 and >10/10		
Conductor cross-sections			[3]					
Short-circuit protection for contactors without overload relays								
Main circuit			For short-circuit protection for contactors with overload relays see "Protection Equipment --> Overload Relays". For short-circuit protection for fuseless load feeders see "Motor Starters".					
• Fuse links, operational class gG : Type NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1								
- Type of coordination "1"		A	63			100	125	
- Type of coordination "2"		A	25			35	50	
- Weld-free[4]		A	10			16	16	
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")		A	25			32	40	
Auxiliary circuit								
• Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)		A	10					
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)		A	10					

[1] Dimensions for devices with screw terminals / spring-type terminals.

[2] For endurance of the main contacts see page 2/124.

[3] For conductor cross-sections page 2/136.

[4] Test conditions according to IEC 60947-4-1.

Contactors	Type		3RT20 23 ... 3RT20 25	3RT20 26 ... 3RT20 28	3RT20 2. -.NB3	3RT20 2. -.NF3..	3RT20 2. -.NP3
	Size		S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45
Control							
Solenoid coil operating range	AC/DC		0.8 ... 1.1 x U_s		0.7 ... 1.3 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing	VA	65	77	6.5	13.6	16.1
	- P.f.		0.82	0.82	0.98	0.98	0.98
	- Closed	VA	7.6	9.8	1.26	1.91	3.41
	- P.f.		0.25	0.25	0.25	0.25	0.25
• AC operation, 50/60 Hz, standard version	- Closing	VA	68/67	81/79	6.5/5.7	13.6/13.2	16.1/15.9
	- P.f.		0.72/0.74	0.72/0.74	0.98/0.96	0.98/0.99	0.99/0.99
	- Closed	VA	7.9/6.5	10.5/8.5	1.26/1.30	1.91/1.90	3.41/3.58
	- P.f.		0.25/0.28	0.25/0.28	0.78/0.8	0.61/0.61	0.36/0.45
• AC operation, 50 Hz, USA/Canada	- Closing	VA	65	77	--	--	--
	- P.f.		0.82	0.82	--	--	--
	- Closed	VA	7.6	9.8	--	--	--
	- P.f.		0.25	0.28	--	--	--
• AC operation, 60 Hz, USA/Canada	- Closing	VA	73	87	--	--	--
	- P.f.		0.76	0.76	--	--	--
	- Closed	VA	7.2	9.4	--	--	--
	- P.f.		0.28	0.28	--	--	--
• DC operation	Closing/closed	W	5.9/5.9	5.9/5.9	6.7/0.8	13.2/1.56	15/1.83
Permissible residual current of the electronics (with 0 signal)							
	• AC operation	mA	< 6 mA x (230 V/U_s)	< 7 mA x (230 V/U_s)			
	• DC operation	mA	< 16 mA x (24 V/U_s)				
Operating times for 0.8 ... 1.1 x U_s [1]							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay	ms	9 ... 38	8 ... 40	60 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	35 ... 45
• DC operation	- Closing delay	ms	50 ... 170	50 ... 170	60 ... 75	50 ... 70	50 ... 75
	- Opening delay	ms	15 ... 17.5	15 ... 17.5	30 ... 45	35 ... 45	40 ... 50
• Arcing time		ms	10	10	10	10	10
Operating times for 1.0 x U_s [1]							
• AC operation	- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	30 ... 50
• DC operation	- Closing delay	ms	55 ... 80	55 ... 80	60 ... 80	56 ... 70	60 ... 80
	- Opening delay	ms	16 ... 17	16 ... 17	30 ... 45	35 ... 45	30 ... 50

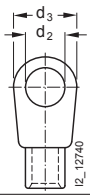
[1] The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

Contactors	Type			3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size			S0	S0	S0	S0	S0	S0
	Width		mm	45	45	45	45	45	45
Main circuit									
AC capacity									
Utilization category AC-1, switching resistive loads									
• Rated operational current I_e	At 40 °C up to 690 V		A	40				50	
	At 60 °C up to 690 V		A	35				42	
• Rated power for AC loads[1] P.f. = 0.95 (at 60 °C)	230 V		kW	13.3				15.5	
	400 V		kW	23				27.5	
	500 V		kW	29				35	
	690 V		kW	40				47.5	
• Minimum conductor cross-section for loads with I_e	At 40 °C		mm^2	10				10	
	At 60 °C		mm^2	10				10	
Utilization category AC-3									
• Rated operational currents I_e	Up to 400 V		A	9	12	17	25	32	38
	440 V		A	9	12	17	22	32	35
	500 V		A	9	12	17	18	32	32
	690 V		A	9	9	13	13	21	21
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V		HP	3	3	5	7.5	10	10
	460 V		HP	5	7.5	10	15	20	25
	575 V		HP	7.5	10	15	20	25	25
Thermal load capacity	10 s current[2]		A	80	110	150	200	260	300
Power loss per conducting path	at I_e/AC-3		W	0.4	0.5	0.9	1.6	2.7	3.8
Utilization category AC-4 (for I_a = 6 x I_e)									
• Rated operational current I_e	Up to 400 V		A	8.5	12.5	15.5	15.5	22	
• Rated power for squirrel-cage motors with 50 and 60 Hz	At 400 V		kW	4	5.5	7.5	7.5	11	
• The following applies to a contact endurance of about 200000 operating cycles:									
- Rated operational currents I_e	Up to 400 V		A	4.1	5.5	7.7	9	12	
	690 V		A	3.3	5.5	7.7	9	12	
- Rated power for squirrel-cage motors with 50 and 60 Hz	At 110 V		kW	0.5	0.73	1	1.2	1.6	
	At 230 V		kW	1.1	1.5	2	2.5	3.4	
	400 V		kW	2	2.6	3.5	4.4	6	
	500 V		kW	2	3.3	4.6	5.6	7.5	
	690 V		kW	2.5	4.6	6	7.7	10.3	
Switching frequency									
Switching frequency *z* in operating cycles/hour									
• Contactors without overload relays	No-load switching frequency AC		h^{-1}	5000					
	No-load switching frequency DC		h^{-1}	1500					
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400\ V/U')^{1.5} \cdot 1/h$		AC-1 (AC/DC)	h^{-1}	1000					
		AC-2 (AC/DC)	h^{-1}	1000			750		
		AC-3 (AC/DC)	h^{-1}	1000			750		
		AC-4 (AC/DC)	h^{-1}	300			250		
• Contactors with overload relays (mean value)			h^{-1}	15					

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

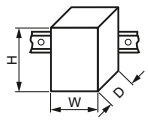
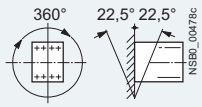
2) According to IEC 60947-4-1.
For rated values for various start-up conditions see Section 3 --> "Overload Relays"

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
Conductor cross-sections (1 or 2 conductors connectable)								
Main conductors			**Screw terminals**					
Conductor cross-section								
• Solid		mm^2	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 10)[1] according to IEC 60947					
• Finely stranded with end sleeve		mm^2	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 6)[1]; 1 x 10					
• AWG cables, solid or stranded		AWG	2 x (16 ... 12); 2 x (14 ... 8)					
• Terminal screws			M4 (Pozidriv size 2)					
- Tightening torque		Nm	2 ... 2.5 (18 ... 22 lb.in)					
Auxiliary conductors								
• Solid		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947					
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]					
• Solid or stranded AWG (2 x)		AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]; 1 x 12					
• Terminal screws			M3					
- Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)					
Main conductors			**Spring-type terminals**					
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5					
• Solid		mm^2	2 x (1 ... 10)					
• Finely stranded with end sleeve		mm^2	2 x (1 ... 6)					
• Finely stranded without end sleeve		mm^2	2 x (1 ... 6)					
• AWG cables, solid or stranded		AWG	2 x (18 ... 8)					
Auxiliary conductors								
• Operating devices			3.0 x 0.5; 3.5 x 0.5					
• Solid		mm^2	2 x (0.5 ... 2.5)					
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)					
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 1.5)					
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)					
Main conductors			**Ring lug terminal connection**					
• Terminal screw		mm	M4, Pozidriv size 2					
• Operating devices		mm	Ø 5 ... 6					
• Tightening torque		Nm	2 ... 2.5					
• Usable ring lug terminals		mm	d_2 = min. 4.3					
- DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve		mm	d_3 = max. 12.2					
Auxiliary conductors								
• Terminal screw			M3, Pozidriv size 2					
• Operating devices		mm	Ø 5 ... 6					
• Tightening torque		Nm	0.8 ... 1.2					
• Usable ring terminal lugs		mm	d_2 = min. 3.2					
		mm	d_3 = max. 7.5					



[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactors	Size		S00	S0	
			Screw or spring-type terminals	Screw or spring-type terminals	Screw or spring-type terminals
			Integrated or snap-on auxiliary switch block	1- and 4-pole snap-on auxiliary switch block	Laterally mountable auxiliary switch block
cULus and cULus rated data of the auxiliary contacts					
Rated voltage		V AC	600	600	600
Switching capacity			A 600, Q 600	A 600, Q 600	A 300, Q 300
Uninterrupted current	• At 240 V AC	A	10	10	10

Type			3RT2035	3RT2036	3RT2037	3RT2038
Size			S2	S2	S2	S2
Dimensions (W x H x D)		mm	55 x 114 x 130			
• With mounted auxiliary switch block[1]		mm	55 x 114 x 174 / 55 x 114 x 178			
• With mounted function module[1]		mm	55 x 114 x 199 / 55 x 114 x 202			
General data						
Permissible mounting position						
The contactors are designed for operation on a vertical mounting surface.						
Upright mounting position			 Special version required			
Mechanical endurance						
• Basic units		Operating cycles	10 million			
• Basic units with snap-on auxiliary switch block		Operating cycles	10 million			
• Solid-state compatible auxiliary switch block		Operating cycles	5 million			
Electrical endurance			[2]			
Rated insulation voltage U_i (pollution degree 3)		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Protective separation between the coil and the main contacts (acc. to IEC 60947-1, Appendix N)		V	400			
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.						
• Integrated auxiliary switches			Yes, acc. to IEC 60947-4-1, Appendix F			
• 3RT202., 3RT232. (removable auxiliary switch block)			Yes, acc. to IEC 60947-4-1, Appendix F			
• 3RT202., 3RT232. (permanently mounted auxiliary switch block)			Yes, acc. to IEC 60947-4-1, Appendix F			
Permissible ambient temperature						
• During operation		°C	-25 ... +60			
• During storage		°C	-55 ... +80			
Degree of protection acc. to IEC 60947-1, Appendix C			IP20			
Connection range			IP00/open (where applicable, use additional terminal covers)			
Touch protection acc. to EN 50274			Finger-safe			
Shock resistance rectangular pulse						
• AC operation		*g*/ms	11.8/5 and 7.4/10			
• AC/DC operation		*g*/ms	7.7/5 and 4.5/10			
Shock resistance sine pulse						
• AC operation		*g*/ms	18.5/5 and 11.6/10			
• AC/DC operation		*g*/ms	12/5 and 7/10			
Conductor cross-sections			[3]			
Short-circuit protection						
Main circuit			Short-circuit protection for contactors with overload relays See Configuration Manual "Configuring SIRIUS Innovations" [4] Short-circuit protection for fuseless load feeders See Chapter 8, "Load Feeders and Motor Starters for Use in the Control Cabinet" → "SIRIUS 3RA2 Load Feeders"			
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1						
- Type of coordination "1"		A	160	160	250	250
- Type of coordination "2"		A	80	80	125	160
- Weld-free[5]		A	On request			
Auxiliary circuit						
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection $I_k \leq 1$ kA)		A	10			
• Miniature circuit breakers 230 V, C characteristic (short-circuit current $I_k < 400$ A)		A	10			

1) Dimensions for devices with screw terminals / spring-type terminals.
2) For contact endurance of the main contacts, see page 3/17.
3) For conductor cross-sections, see page 3/28.
4) See http://support.automation.siemens.com/WW/view/en/39714188
5) Test conditions according to IEC 60947-4-1.

Type				3RT2035	3RT2036	3RT2037	3RT2038
Size				S2	S2	S2	S2
Control							
Type of operating mechanism				AC			AC/DC
Solenoid coil operating range							
• AC operation, 50 Hz				0.8 ... 1.1 x U_s	0.8 ... 1.1 x U_s	0.8 ... 1.1 x U_s	0.8 ... 1.1 x U_s
• AC operation, 60 Hz				--	0.85 ... 1.1 x U_s	0.8 ... 1.1 x U_s	0.8 ... 1.1 x U_s
• DC operation				--			0.8 ... 1.1 x U_s
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing		VA	190	--		
	- P.f.			0.72	--		
	- Closed		VA	16	--		
	- P.f.			0.37	--		
• AC operation, 50/60 Hz, standard version	- Closing		VA	--	210/188	--	
	- P.f.			--	0.69/0.65	--	
	- Closed		VA	--	17.2/16.5	--	
	- P.f.			--	0.36/0.39	--	
• AC operation, 50/60 Hz, for USA/Canada	- Closing		VA	--		212/188	--
	- P.f.			--		0.67/0.65	--
	- Closed		VA	--		18.516.5	--
	- P.f.			--		0.37/0.39	--
• AC/DC operation	- Closing for AC operation		VA	--			40
	- P.f.			--			0.64/0.5
	- Closed for AC operation		VA	--			2
	- P.f.			--			0.36/0.39
	- Closing for DC operation		W	--			23
	- Closed for DC operation		W	--			1
Permissible residual current of the electronics (with 0 signal)							
• AC operation			mA	<20			
• DC operation			mA	<20			
Operating times for 0.8 ... 1.1 x U_s [1]							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay		ms	10 ... 80			45 ... 70
	- Opening delay		ms	10 ... 18			35 ... 55
• DC operation	- Closing delay		ms	--			45 ... 60
	- Opening delay		ms	--			35 ... 55
• Arcing time			ms	10 ... 20			10 ... 20
Operating times for 1.0 x U_s [1]							
• AC operation	- Closing delay		ms	12 ...22			50 ... 60
	- Opening delay		ms	10 ...18			40 ... 50
• DC operation	- Closing delay		ms	--			45 ... 55
	- Opening delay		ms	--			40 ... 50
Main circuit							
Load rating with AC							
Utilization category AC-1, switching resistive loads							
• Rated operational current I_e	At 40 °C up to 690 V		A	60	70	80	90
	At 60 °C up to 690 V		A	55	60	70	80
• Rated power for AC loads [2]	230 V		kW	23	26	30	34
P.f. = 0.95 (at 60 °C)	400 V		kW	39	46	53	59
	690 V		kW	68	79	91	102
• Minimum conductor	At 40 °C		mm^2	16	25	25	35
cross-section for loads with I_e	At 60 °C		mm^2	16	16	25	25
Utilization categories AC-2 and AC-3							
• Rated operational currents I_e	Up to 400 V		A	40	50	65	80
	440 V		A	40	50	65	80
	500 V		A	40	50	65	80
	690 V		A	24	24	47	58
• Rated power for slipring	At 230 V		kW	11	15	18.5	22
or squirrel-cage motors	400 V		kW	18.5	22	30	37
at 50 and 60 Hz	690 V		kW	22	22	37	45
Thermal load capacity	10 s current [3]		A	400	420	520	640
Power loss per conducting path	At I_e/AC-3		W	2.2	4	3.8	5.7

[1] The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

[2] Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

[3] According to IEC 60947-4-1.
Rated values for various start-up conditions,
see Chapter 7, "Protection Equipment" → "Overload Relays".

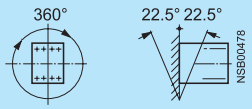
Type				3RT2035	3RT2036	3RT2037	3RT2038
Size				S2	S2	S2	S2
Main circuit							
Load rating with AC							
Utilization category AC-4 (for I_a = 6 x I_e)							
• Maximum values:							
- Rated operational current I_e	Up to 400 V	A		35	41	55	55
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW		18.5	22	30	30
• The following applies to a contact endurance of about 200 000 operating cycles:							
- Rated operational currents I_e	Up to 400 V	A		22	24	28	30
	690 V	A		18.5	20	22	24
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 110 V	kW		3.2	3.5	4.1	4.3
	230 V	kW		6.7	7.3	8.5	9.1
	400 V	kW		11.6	12.6	14.7	15.8
	690 V	kW		16.8	18.2	20	21.8
Load rating with DC							
Utilization category DC-1, switching resistive loads (*L/R* ≤ 1 ms)							
• Rated operational currents I_e (at 60 °C)							
- 1 conducting path	Up to 24 V	A		55			
	60 V	A		23			
	110 V	A		4.5			
	220 V	A		1			
	440 V	A		0.4			
	600 V	A		0.25			
- 2 conducting paths in series	Up to 24 V	A		55			
	60 V	A		45			
	110 V	A		25			
	220 V	A		5			
	440 V	A		1			
	600 V	A		0.8			
- 3 conducting paths in series	Up to 24 V	A		55			
	60 V	A		55			
	110 V	A		55			
	220 V	A		45			
	440 V	A		2.9			
	600 V	A		1.4			
Utilization category DC-3/DC-5, shunt-wound and series-wound motors (*L/R* ≤ 15 ms)							
• Rated operational currents I_e (at 60 °C)							
- 1 conducting path	Up to 24 V	A		35			
	60 V	A		6			
	110 V	A		2.5			
	220 V	A		2			
	440 V	A		0.1			
	600 V	A		0.06			
- 2 conducting paths in series	Up to 24 V	A		55			
	60 V	A		45			
	110 V	A		25			
	220 V	A		5			
	440 V	A		0.27			
	600 V	A		0.16			
- 3 conducting paths in series	Up to 24 V	A		55			
	60 V	A		55			
	110 V	A		55			
	220 V	A		25			
	440 V	A		0.6			
	600 V	A		0.35			
Switching frequency							
Switching frequency *z* in operating cycles/hour							
Contactors without overload relays							
• No-load switching frequency	AC	h^{-1}		5 000			
	AC/DC	h^{-1}		1 500			
• Switching frequency *z* during rated operation[1)]							
- I_e/AC-1	At 400 V	h^{-1}		1 200	1 000	800	700
- I_e/AC-2	At 400 V	h^{-1}		750	600	400	350
- I_e/AC-3	At 400 V	h^{-1}		1 000	800	700	500
- I_e/AC-4	At 400 V	h^{-1}		300	250	200	150
Contactors with overload relays							
• Mean value		h^{-1}		15			

1) Dependence of the switching frequency *z'* on the operational current *I'* and operational voltage *U'*:
$z' = z \times (I_e/I') \times (400\ V/U')^{1.5} \times 1/h$

Type		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2	S2	S2	S2
Conductor cross-sections (1 or 2 conductors connectable)					
Main conductors		Screw terminals			
• Solid or stranded	mm²	2 x (1 ... 35)[1]; 1 x (1 ... 50)[1]			
• Finely stranded with end sleeve	mm²	2 x (1 ... 25)[1]; 1 x (1 ... 35)[1]			
• AWG cables, solid or stranded	AWG	2 x (18 ... 2)[1]; 1 x (18 ... 1)[1]			
• Terminal screws - Tightening torque	Nm	Pozidriv size 2; Ø 5 ... 6 3 ... 4.5 (27 ... 40 lb.in)			
Auxiliary and control conductors					
• Solid or stranded	mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]			
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]			
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]			
• Terminal screws - Tightening torque	Nm	M3 (for Pozidriv size 2, Ø 5 ... 6) 0.8 ... 1.2 (7 ... 10.3 lb.in)			
Auxiliary and control conductors[2]		Spring-type terminals			
• Operating devices[3]	mm	3.0 x 0.5			
• Solid or stranded	mm²	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve	mm²	2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve	mm²	2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			

1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.
2) Max. external diameter of the cable insulation: 3.6 mm.
On spring-type terminals with conductor cross-sections ≤ 1 mm², an insulation stop must be used, see Accessories, page 3/76.
3) Tool for opening the spring-type terminals;
see "Accessories", page 3/76.

Technical data

Contactor	Size / Type			S3 3RT20 45	S3 3RT20 46	S3 3RT20 47
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.		AC and DC operation		 For DC operation and forward inclination up to 22.5°: coil voltage tolerance 0.85 ... 1.1 x U_s		
Upright mounting position:		AC and DC operation		 Special design required. Positions 13 to 16 of the Order No. must be changed to **-1AA0**. Additional charge.		
Mechanical endurance	Basic units		Oper. cycles	10 million		
	Basic unit with snap-on auxiliary switch block			10 million		
	Solid-state compatible aux. switch block			5 million		
Electrical endurance				See page 2/125.		
Rated insulation voltage U_i (pollution degree 3)			V	1000		
Rated impulse withstand voltage U_{imp}			kV	6		
Safe isolation between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time		3RT20 4 ., 3RT23 4 ., 3RT24 5 . (removable aux. switch block)		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
		3RT20 4 ., 3RT23 4 ., 3RT24 5 . (permanent aux. switch block)		in accordance with Swiss regulations (SUVA) on request.		
Permissible ambient temperature		in operation	°C	–25 ... +60		
		when stored	°C	–55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 20 (terminal compartment IP 00), coil system IP 40		
Shock resistance	Rectangular pulse	AC and DC operation	*g*/ms	6.8/5 and 4/10		
	Sine pulse	AC and DC operation	*g*/ms	10.6/5 and 6.2/10		
Conductor cross-sections				See page 2/144.		
Short-circuit protection of contactors without overload relays				For short-circuit protection of contactors with overload relays, see Section 3. For short-circuit protection of fuseless load feeders, see Section 4.		
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4/ EN 60 947-4-4 (VDE 0660 Part 102)		Type of coord. "1" [1]	A	250	250	
		Type of coord. "2" [1]	A	125	160	
		Weld-free [2]	A	63	100	
Auxiliary circuit Fuse links, utilization category gL/gG DIAZED Type 5SB, NEOZED Type 5SE (weld-free protection at $I_k \geq 1$ kA)			A	10		
or miniature circuit-breaker with C-characteristic (short-circuit current $I_k < 400$ A)			A	10		

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

Contactor	Size Type			S3 3RT20 45	S3 3RT20 46	S3 3RT20 47
Control circuit						
Coil voltage tolerance		AC/DC		0.8 to 1.1 × U_s		
Power consumption of the coils (with coil in cold state and 1.0 × U_s)				**Standard design**		
AC operation			Hz	50 / 50/60	50 / 50/60	
	Closing p.f.		VA 	218 / 247 /211 0.61 / 0.62/ 0.57	270 / 298 /274 0.68 / 0.7/ 0.62	
	Closed p.f.		VA 	21 / 25 / 18 0.26 / 0.27/ 0.3	22 / 27 / 20 0.27 / 0.29/ 0.31	
				For USA and Canada		
			Hz	50 / 60	50 / 60	
	Closing p.f.		VA 	218 / 232 0.61 / 0.55	270 / 300 0.68 / 0.52	
	Closed p.f.		VA 	21 / 20 0.26 / 0.28	22 / 21 0.27 / 0.29	
DC operation	closing = closed		W	15	15	
Permissible residual current of the electronics (with 0 signal)						
	AC operation		mA	< 25 mA × $\left(\frac{230\ V}{U_s}\right)$		
	DC operation		mA	< 43 mA × $\left(\frac{24\ V}{U_s}\right)$		
Operating times at 0.8 to 1.1 × U_s [1] Break-time = opening time + arcing time						
AC operation	closing time opening time		ms ms	16 ... 57 10 ... 19	17 ... 90 10 ... 25	
DC operation	closing time opening time		ms ms	90 ... 230 14 ... 20	90 ... 230 14 ... 20	
Arcing time			ms	10 ... 15	10 ... 15	
Operating times at 1.0 × U_s [1]						
AC operation	closing time opening time		ms ms	18 ... 34 11 ... 18	18 ... 30 11 ... 23	
DC operation	closing time opening time		ms ms	100 ... 120 16 ... 20	100 ... 120 16 ... 20	
Main circuit						
Load ratings with AC						
AC-1 utilization category, switching resistive load						
Rated operational currents I_e		at 40 °C up to 690 V 1000 V at 60 °C up to 690 V 1000 V	A A A A	100 50 90 40	120 60 100 50	120 70 100 60
Ratings of three-phase loads [2] p.f. = 0.95 (at 60 °C)		at 230 V 400 V 500 V 690 V 1000 V	kW kW kW kW kW	34 59 74 102 66	38 66 82 114 82	38 66 82 114 98
Minimum conductor cross-section with $I_{e\ load}$		at 40 °C 60 °C	mm² mm²	35 35	50 35	50 35
AC-2 and AC-3 utilization categories						
Rated operational currents I_e		up to 400 V 500 V 690 V 1000 V	A A A A	65 65 47 25	80 80 58 30	95 95 58 30
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz		at 230 V 400 V 500 V 690 V 1000 V	kW kW kW kW kW	18.5 30 37 55 30	22 37 45 55 37	22 45 55 55 37
Thermal loading capacity		10 s current [3]	A	600	760	760
Power loss per conducting path		at I_e/AC-3	W	4.6	7.7	10.8

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms, diode assem-

2) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

3) Acc. to VDE 0660 Part 102.
For rated values for various starting conditions, see Section 3.

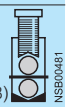
Technical data

Contactor	Size Type			S3 3RT20 45		S3 3RT20 46		S3 3RT20 47	
Main circuit									
Load ratings with AC									
AC-4 utilization category (at $I_a = 6 \times I_e$)									
Rated operational current I_e		up to 400 V	A	55		66		80	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz		at 400 V	kW	30		37		45	
• For a contact endurance of approx. 200 000 operating cycles:									
Rated operational currents I_e		up to 400 V	A	28		34		42	
		690 V	A	28		34		42	
		1000 V	A	20		23		23	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz		at 230 V	kW	8.7		10.4		12	
		400 V	kW	15.1		17.9		22	
		500 V	kW	18.4		22.4		27	
		690 V	kW	25.4		30.9		38	
		1000 V	kW	22		30		30	
AC-5a utilization category, switching gas discharge lamps per main conducting path at 230 V									
	Rating per lamp	Rated operational current per lamp (A)							
	uncorrected								
	L 18 W	0.37	Units	243		270			
	L 36 W	0.43	Units	209		232			
	L 58 W	0.67	Units	134		149			
	lead-lag								
	L 18 W	0.11	Units	818		909			
	L 36 W	0.21	Units	428		476			
	L 58 W	0.32	Units	281		312			
Switching gas discharge lamps with correction, electronic ballast per main conducting path at 230 V									
Rating per lamp	Capacitor (µF)	Rated operational current per lamp (A)							
Parallel correction									
L 18 W	4.5	0.11	Units	160		197		234	
L 36 W	4.5	0.21	Units	160		197		234	
L 58 W	7	0.32	Units	103		127		150	
With electronic ballast, single lamp									
L 18 W	6.8	0.10	Units	455		560		665	
L 36 W	6.8	0.18	Units	253		311		369	
L 58 W	10	0.27	Units	168		207		246	
With electronic ballast, twin lamp									
L 18 W	10	0.18	Units	253		311		369	
L 36 W	10	0.35	Units	130		160		190	
L 58 W	22	0.52	Units	88		108		128	
AC-5b utilization category, switching incandescent lamps per main conducting path at 230/220 V			kW	9		14.6		17.3	
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20	30	20	30	20
Rated operational current I_e		up to 400 V	A	42.3	63.5	56.3	80	56.3	84.4
		690 V	A	42.3	47	56.3	58	56.3	58
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:		at 230 V	kVA	16.8	25.3	22.4	31.9	22.4	33.6
		400 V	kVA	29.3	43.9	39	55.4	39	58
		500 V	kVA	36.6	54.9	48.7	69.3	48.7	73.1
		690 V	kVA	50.3	56.2	67.3	69.3	67.3	69.3
$P_x = P_{n30} \cdot \frac{30}{x}$									
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C									
Rated operational currents I_e		up to 400 V	A	57		72			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and		at 230 V	kvar	24		29			
		400 V	kvar	40		50			
		525 V	kvar	50		65			
		690 V	kvar	40		50			

Technical data

Contactor / Size / Type			S3 3RT20 45			S3 3RT20 46			S3 3RT20 47		
Main circuit											
Load ratings with DC											
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)											
Rated operational current I_e (at 60 °C)											
Number of conducting paths connected in series			1	2	3	1	2	3	1	2	3
up to 24 V		A	90	90	90	100	100	100	100	100	100
60 V		A	23	90	90	60	100	100	60	100	100
110 V		A	4.5	90	90	9	100	100	9	100	100
220 V		A	1	5	70	2	10	80	2	10	80
440 V		A	0.4	1	2.9	0.6	1.8	1.8	0.6	1.8	4.5
600 V		A	0.26	0.8	1.4	0.4	1	1	0.4	1	2.6
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)											
Rated operational current I_e (at 60 °C)											
Number of conducting paths connected in series			1	2	3	1	2	3	1	2	3
up to 24 V		A	40	90	90	40	100	100	40	100	100
60 V		A	6	90	90	6.5	100	100	6.5	100	100
110 V		A	2.5	90	90	2.5	100	100	2.5	100	100
220 V		A	1	7	35	1	7	35	1	7	35
440 V		A	0.15	0.42	0.8	0.15	0.42	0.8	0.15	0.42	0.8
600 V		A	0.06	0.16	0.35	0.06	0.16	0.35	0.06	0.16	0.35
Operating frequency											
Operating frequency z in operating cycles per hour			AC	DC		AC	DC		AC	DC	
Contactors without overload relays	No-load operating frequency	1/h	5000	1000		5000	1000		5000	1000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':			AC/DC			AC/DC			AC/DC		
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h	for AC-1	1/h	1000			900			900		
	for AC-2	1/h	400			400			350		
	for AC-3	1/h	1000			1000			850		
	for AC-4	1/h	300			300			250		
Contactors with overload relays (mean value)		1/h	15			15			15		

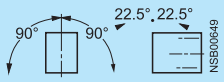
Contactor / Size / Type			S3 3RT20 4.		
Conductor cross-sections					
Screw connections (1 or 2 conductor connections possible)	**Main conductor:** With box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	2.5 ... 35	2.5 ... 50	max. 2 × 35
	Finely stranded without end sleeve	mm²	4 ... 50	10 ... 50	max. 2 × 35
	Solid	mm²	2.5 ... 16	2.5 ... 16	max. 2 × 16
	Stranded	mm²	4 ... 70	10 ... 70	max. 2 × 50
	Ribbon cable (qty. × width × thickness)	mm	6 × 9 × 0.8	6 × 9 × 0.8	2 × (6 × 9 × 0.8)
	AWG conductor connections, solid and stranded	AWG	10 ... 2/0	10 ... 2/0	2 × (10 ... 1/0)
	– Terminal screws		M 6 (hexagon socket)		
	– Tightening torque	Nm	4 ... 6 (36 ... 53 lb.in)		
Connection for drilled copper bars	max. width	mm	10	If bars larger than 12 × 10 mm are connected, a 3RT19 46-4EA1 terminal cover is to comply with the phase clearance.	
Without box terminal With cable lugs (1 or 2 conductor connections possible)	Finely stranded with cable lug	mm²	10 ... 50[1]	If conductors larger than 25 mm² are connected, a 3RT19 46-4EA1 terminal cover is needed to comply with the phase clearance.	
	Stranded with cable lug	mm²	10 ... 70[1]		
	AWG conductor connections, solid or stranded		7 ... 1/0		
	Auxiliary conductor:				
	Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (20 ... 16); 2 × (18 ... 14); 1 × 12		
	– Terminal screws		M 3		
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		
Cage Clamp connections (1 or 2 conductor connections possible)	**Auxiliary conductor:**				
	Solid	mm²	2 × (0.25 ... 2.5)		
	Finely stranded with end sleeve	mm²	2 × (0.25 ... 1.5)		
	Finely stranded without end sleeve	mm²	2 × (0.25 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (24 ... 14)		



- For tool for opening the Cage Clamp connection, see on accessories page 2/81
- An "insulation stop" must be used for conductor cross-sections ≤1 mm2, see accessories on page 2/81.
- Max. outer diameter of conductor insulation: 3.6 mm.
- For information about Cage Clamp connections, see Appendix page 19/17.

1) Only crimping cable lugs acc. to DIN 46 234

Technical data

Contactor / Size / Type				S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.						
Mechanical endurance			Oper. cycles	10 million		
Electrical endurance				See page 2/125		
Rated insulation voltage U_i (pollution degree 3)			V	1000		
Rated impulse withstand voltage U_{imp}			kV	8		
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time				Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20		
Shock resistance	Rectangular pulse Sine pulse		*g*/ms *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections				See page 2/147		
Electromagnetic compatibility (EMC)				See page 2/108		
Short-circuit protection of contactors without overload relays				See Part 4.		
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4-1/EN 60 947-4-1		Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]	A A A	355 315 80	355 315 160	
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10		

Contactor / Size / Type				S6 3RT10 5.			
Control circuit							
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism		Solid-state op. mechanism	
				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	Closing p.f. Closed p.f.		VA VA 	250 0.9 4.8 0.8	300 0.9 5.8 0.8	190 0.8 3.5 0.5	280 0.8 4.4 0.4
DC operation	Closing Closed		W W	300 4.3	360 5.2	250 2.3	320 2.8
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA			
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time		ms ms	20 ... 95 40 ... 60		95 ... 135 80 ... 90	35 ... 75 80 ... 90
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time		ms ms	25 ... 50 40 ... 60		100 ... 120 80 ... 90	40 ... 60 80 ... 90
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

Contactor / Size / Type				S6 3RT10 54		S6 3RT10 55		S6 3RT10 56	
Main circuit									
Load ratings with AC									
AC-1 utilization category, switching resistive load									
Rated operational currents I_e	at 40 °C up to 690 V	A		160		185		215	
	at 60 °C up to 690 V	A		140		160		185	
	at 60 °C up to 1000 V	A		80		90		100	
Ratings of three-phase loads [1] p.f. = 0.95 (at 60 °C)	at 230 V	kW		53		60		70	
	400 V	kW		92		105		121	
	500 V	kW		115		131		152	
	690 V	kW		159		181		210	
	1000 V	kW		131		148		165	
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C	mm^2		70		95		95	
	60 °C	mm^2		50		70		95	
AC-2 and AC-3 utilization categories									
Rated operational currents I_e	up to 500 V	A		115		150		185	
	690 V	A		115		150		170	
	1000 V	A		53		65		65	
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		37		50		61	
	400 V	kW		64		84		104	
	500 V	kW		81		105		132	
	690 V	kW		113		146		167	
	1000 V	kW		75		90		90	
Thermal loading capacity	10 s current [2]	A		1100		1300		1480	
Power loss per conducting path	at I_e/AC-3/500 V	W		7		9		13	
AC-4 utilization category (at $I_a = 6 \times I_e$)									
Rated operational current I_e	up to 400 V	A		97		132		160	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW		55		75		90	
• For a contact endurance of approx. 200 000 operating cycles:									
Rated operational currents I_e	up to 500 V	A		54		68		81	
	690 V	A		48		57		65	
	1000 V	A		34		38		42	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		16		20		25	
	400 V	kW		29		38		45	
	500 V	kW		37		47		57	
	690 V	kW		48		55		65	
	1000 V	kW		49		55		60	
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20	30	20	30	20
Rated operational current I_e	up to 690 V	A		90	115	99	148	99	148
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x: $P_x = P_{n30} \cdot \frac{30}{x}$	at 230 V	kVA		35	45	39	58	39	58
	400 V	kVA		62	79	68	102	68	102
	500 V	kVA		77	99	85	128	85	128
	690 V	kVA		107	137	118	176	118	176
	1000 V	kVA		80	80	98	98	117	117
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C									
Rated operational currents I_e	up to 500 V	A		105		125		145	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar		42		50		58	
	400 V	kvar		72		86		100	
	500 V	kvar		90		108		125	
	690 V	kvar		72		86		100	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

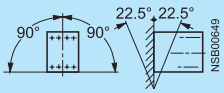
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Technical data

Contactor / Size / Type			S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
Main circuit					
Load ratings with DC					
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)					
Rated operational current I_e (at 60 °C)					
Number of conducting paths connected in series			1	2	3
up to 24 V		A	160	160	160
60 V		A	160	160	160
110 V		A	18	160	160
220 V		A	3.4	20	160
440 V		A	0.8	3.2	1.4
600 V		A	0.5	1.6	0.75
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)					
Rated operational current I_e (at 60 °C)					
Number of conducting paths connected in series			1	2	3
up to 24 V		A	160	160	160
60 V		A	7.5	160	160
110 V		A	2.5	160	160
220 V		A	0.6	2.5	160
440 V		A	0.17	0.65	11.5
600 V		A	0.12	0.37	4
Operating frequency					
Operating frequency *z* in operating cycles per hour					
Contactors without overload relays	No-load operating frequency	1/h	2000		2000
Dependence of the operating frequency *z'* on the operational current *I'* and the operational voltage *U'*:	for AC-1	1/h	800		800
	for AC-2	1/h	400		300
	for AC-3	1/h	1000		750
	for AC-4	1/h	130		130
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h					
Contactors with overload relays (mean value)		1/h	60		60

Contactor / Size / Type			S6 3RT10 5.
Conductor cross-sections			
Screw connections	**Main conductor:** with 3RT19 55-4G box terminal (75 HP)		Front terminal connected / Back terminal connected / Both terminals connected
	finely stranded with end sleeve	mm²	16 ... 70 / 16 ... 70 / max. 1 × 50, 1 × 70
	Finely stranded without end sleeve	mm²	16 ... 70 / 16 ... 70 / max. 1 × 50, 1 × 70
	Stranded	mm²	16 ... 70 / 16 ... 70 / max. 2 × 70
	AWG conductor connections, solid/stranded		6 ... 2/0 / 6 ... 2/0 / max. 2 × 1/0
	Ribbon cable (qty. x width × thickness)	mm	min. 3 × 9 × 0.8 / min. 3 × 9 × 0.8
		mm	max. 6 × 15.5 × 0.8 / max. 6 × 15.5 × 0.8 / max. 2 × (6 × 15,5 × 0.8)
	with 3RT19 56-4G box terminal		
	Finely stranded with end sleeve	mm²	16 ... 120 / 16 ... 120 / max. 1 × 95, 1 × 120
	Finely stranded without end sleeve	mm²	16 ... 120 / 16 ... 120 / max. 1 × 95, 1 × 120
	Stranded	mm²	16 ... 120 / 16 ... 120 / max. 2 × 120
	AWG conductor connections, solid/stranded		6 ... 250 kcmil / 6 ... 250 kcmil / max. 2 × 3/0
	Ribbon cable (qty. × width × thickness)	mm	min. 3 × 9 × 0.8
		mm	max. 10 × 15.5 × 0.8 / max. 10 × 15.5 × 0.8 / max. 2 × (10 × 15.5 × 0.8)
	– Terminal screws		M 10 (hexagon socket, A/F4)
	– Tightening torque	Nm	10 ... 12 (90 ... 110 lb.in)
	Without box terminal/busbar connection		
	Finely stranded with cable lug	mm²	16 ... 95
	Stranded with cable lug	mm²	25 ... 120
			If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm² a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.
	AWG conductor connections, solid or stranded	AWG	4 ... 250 kcmil
	Connecting bar (max. width)	mm	17
	– Terminal screws		M 8 × 25 (A/F 13)
	– Tightening torque	Nm	10 ... 14 (89 ... 124 lb.in)
	Auxiliary conductor:		
	Solid	mm²	2 × (0.5 ...1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)
	– Terminal screws		M 3 (PZ 2)
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)

Technical data

Contactor / Size / Type				S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.						
Mechanical endurance			Oper. cycles	10 million		
Electrical endurance				See page 2/125		
Rated insulation voltage U_i (pollution degree 3)			V	1000		
Rated impulse withstand voltage U_{imp}			kV	8		
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time				Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20		
Shock resistance	Rectangular pulse Sine pulse		g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections				See page 2/150		
Electromagnetic compatibility (EMC)				See page 2/108		
Short-circuit protection						
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4-1/EN 60 947-4-1		Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]	A A A	500 400 250		
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10		

Contactor / Size / Type				S10 3RT10 6.			
Control circuit							
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism		Solid-state op. mechanism	
				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing p.f. closed p.f.		VA VA 	490 0.9 5.6 0.9	590 0.9 6.7 0.9	400 0.8 4 0.5	530 0.8 5 0.4
DC operation	closing closed		W W	540 6.1	650 7.4	440 3.2	580 3.8
PLC control input (EN 61 131-2/Type 2)				DC 24 V /≤ 30 mA			
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time		ms ms	30 ... 95 40 ... 80		105 ... 145 80 ... 100	45 ... 80 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time		ms ms	35 ... 50 50 ... 80		110 ... 130 80 ... 100	50 ... 65 80 ... 100
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

Contactor / Size / Type				S10 3RT10 64		S10 3RT10 65		S10 3RT10 66	
Main circuit									
Load ratings with AC									
AC-1 utilization category, switching resistive load									
Rated operational currents I_e	at 40 °C up to 690 V		A	275		330			
	at 60 °C up to 690 V		A	250		300			
	at 60 °C up to 1000 V		A	100		150			
Ratings of three-phase loads [1] p.f. = 0.95 (at 60 °C)	at 230 V		kW	94		113			
	400 V		kW	164		197			
	500 V		kW	205		246			
	690 V		kW	283		340			
	1000 V		kW	164		246			
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C		mm^2	150		185			
	60 °C		mm^2	120		185			
AC-2 and AC-3 utilization categories									
Rated operational currents I_e	up to 500 V		A	225		265		300	
	690 V		A	225		265		280	
	1000 V		A	68		95		95	
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V		kW	73		85		97	
	400 V		kW	128		151		171	
	500 V		kW	160		189		215	
	690 V		kW	223		265		280	
	1000 V		kW	90		132		132	
Thermal loading capacity	10 s current [2]		A	1800		2400		2400	
Power loss per conducting path	at I_e/AC-3/500 V		W	17		18		22	
AC-4 utilization category (at $I_a = 6 \times I_e$)									
Rated operational current I_e	up to 400 V		A	195		230		280	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V		kW	110		132		160	
• For a contact endurance of approx. 200 000 operating cycles:									
Rated operational currents I_e	up to 500 V		A	96		117		125	
	690 V		A	85		105		115	
	1000 V		A	42		57		57	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V		kW	30		37		40	
	400 V		kW	54		66		71	
	500 V		kW	67		82		87	
	690 V		kW	82		102		112	
	1000 V		kW	59		80		80	
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20	30	20	30	20
Rated operational current I_e	up to 690 V		A	151	227	182	265	182	273
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x: $P_x = P_{n30} \cdot \frac{30}{x}$	at 230 V		kVA	60	90	72	105	72	109
	400 V		kVA	105	157	126	183	126	189
	500 V		kVA	130	196	158	229	158	236
	690 V		kVA	180	271	217	317	217	326
	1000 V		kVA	117	117	164	164	164	164
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C									
Rated operational currents I_e	up to 500 V		A	183		220			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V		kvar	73		88			
	400 V		kvar	127		152			
	500 V		kvar	159		191			
	690 V		kvar	127		152			

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

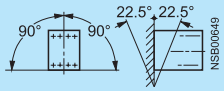
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Technical data

Contactor Size Type			S10 3RT10 64			S10 3RT10 65			S10 3RT10 66		
Main circuit											
Load ratings with DC											
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)											
Rated operational current I_e (at 60 °C)											
Number of conducting paths connected in series			1	2	3	1	2	3			
	up to 24 V	A	200	200	200	300	300	300			
	60 V	A	200	200	200	300	300	300			
	110 V	A	18	200	200	33	300	300			
	220 V	A	3.4	20	200	3.8	300	300			
	440 V	A	0.8	3.2	11.5	0.9	4	11			
	600 V	A	0.5	1.6	4	0.6	2	5.2			
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)											
Rated operational current I_e (at 60 °C)											
Number of conducting paths connected in series			1	2	3	1	2	3			
	up to 24 V	A	200	200	200	300	300	300			
	60 V	A	7.5	200	200	11	300	300			
	110 V	A	2.5	200	200	3	300	300			
	220 V	A	0.6	2.5	200	0.6	2.5	300			
	440 V	A	0.17	0.65	1.4	0.18	0.65	1.4			
	600 V	A	0.12	0.37	0.75	0.125	0.37	0.75			
Operating frequency											
Operating frequency *z* in operating cycles per hour											
Contactors without overload relays	No-load operating frequency	1/h	2000			2000			2000		
Dependence of the operating frequency *z'* on the operational current *I'* and the operational voltage *U'*:	for AC-1	1/h	750			800			750		
	for AC-2	1/h	250			300			250		
	for AC-3	1/h	500			700			500		
	for AC-4	1/h	130			130			130		
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h											
Contactors with overload relays (mean value)		1/h	60			60			60		

Contactor Size Type			S10 3RT10 6.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	
		mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)
	– Terminal screws		M 12 (hexagon sokket, A/F 5)		
	– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	70 ... 240		
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
	Connecting bar (max. width)	mm	25		
	– Terminal screws		M 10 × 30 (A/F 17)		
	– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
	Auxiliary conductor:				
	Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
	– Terminal screws		M 3 (PZ 2)		
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		

Technical data

Contactor / Size / Type				S12 3RT10 75	S12 3RT10 76
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance			Oper. cycles	10 million	
Electrical endurance				See page 2/125	
Rated insulation voltage U_i (pollution degree 3)			V	1000	
Rated impulse withstand voltage U_{imp}			kV	8	
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690	
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time				Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)	
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80	
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20	
Shock resistance	Rectangular pulse Sine pulse		*g*/ms *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections				See page 2/153	
Electromagnetic compatibility (EMC)				See page 2/108	
Short-circuit protection					
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660 Part 102)	Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]		A A A	630 500 250	630 500 315
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10	
Control circuit					
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism $U_{s\,min}$ / $U_{s\,max}$	Solid-state op. mechanism $U_{s\,min}$ / $U_{s\,max}$
AC operation	closing p.f. closed p.f.		VA VA 	700 / 830 0.9 / 0.9 7.6 / 9.2 0.9 / 0.9	560 / 750 0.8 / 0.8 5.4 / 7 0.8 / 0.8
DC operation	closing closed		W W	770 / 920 8.5 / 10	600 / 800 4 / 5
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA	
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism	Solid-state op. mechanism Operation via A1/A2 / PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time		ms ms	45 ... 100 60 ... 100	120 ... 150 / 60 ... 90 80 ... 100 / 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time		ms ms	50 ... 70 70 ... 100	125 ... 150 / 65 ... 80 80 ... 100 / 80 ... 100
Arcing time			ms	10 ... 15	10 ... 15 / 10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

Contactor / Size / Type				S12 3RT10 75		S12 3RT10 76	
Main circuit							
Load ratings with AC							
AC-1 utilization category, switching resistive load							
Rated operational currents I_e	at 40 °C up to 690 V	A		430		610	
	at 60 °C up to 690 V	A		400		550 [3]	
	at 60 °C up to 1000 V	A		200		200	
Ratings of three-phase loads [1] p.f. = 0.95 (at 60 °C)	at 230 V	kW		151		208	
	400 V	kW		263		362	
	500 V	kW		329		452	
	690 V	kW		454		624	
	1000 V	kW		329		329	
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C	mm^2		2 × 150		2 × 185	
	60 °C	mm^2		240		2 × 185	
AC-2 and AC-3 utilization categories							
Rated operational currents I_e	up to 500 V	A		400		500 [4]	
	690 V	A		400		450	
	1 000 V	A		180		180	
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		132		164	
	400 V	kW		231		291	
	500 V	kW		291		363	
	690 V	kW		400		453	
	1 000 V	kW		250		250	
Thermal loading capacity	10 s current [2]	A		3200		4000	
Power loss per conducting path	at I_e/AC-3/500 V	W		35		55	
AC-4 utilization category (at $I_a = 6 \times I_e$)							
Rated operational current I_e	up to 400 V	A		350		430	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW		200		250	
• For a contact endurance of approx. 200 000 operating cycles:							
Rated operational currents I_e	up to 500 V	A		150		175	
	690 V	A		135		150	
	1 000 V	A		80		80	
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		48		56	
	400 V	kW		85		98	
	500 V	kW		105		123	
	690 V	kW		133		148	
	1 000 V	kW		113		113	
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20	30	20
Rated operational current I_e	up to 690 V	A		251	377	270	404
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x: $P_x = P_{n\,30} \cdot \frac{30}{x}$	at 230 V	kVA		100	150	107	161
	400 V	kVA		173	261	187	280
	500 V	kVA		217	326	234	350
	690 V	kVA		300	450	323	483
	1000 V	kVA		311	311	311	311
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C							
Rated operational currents I_e	up to 500 V	A		287		407	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar		114		162	
	400 V	kvar		199		282	
	500 V	kvar		248		352	
	690 V	kvar		199		282	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

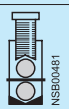
3) Ambient temperature 50 °C for 3RT10 76-.N contactor

4) Ambient temperature 55 °C for 3RT10 76-.N contactor

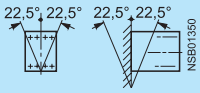
Technical data

Contactor	Size Type		S12 3RT10 75	S12 3RT10 76
Main circuit				
Load ratings with DC				
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)				
Rated operational current I_e (at 60 °C)				
	Number of conducting paths connected in series		1 / 2 / 3	
	up to 24 V	A	400 / 400 / 400	
	60 V	A	330 / 400 / 400	
	110 V	A	33 / 400 / 400	
	220 V	A	3.8 / 400 / 400	
	440 V	A	0.9 / 4 / 11	
	600 V	A	0.6 / 2 / 5.2	
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)				
Rated operational current I_e (at 60 °C)				
	Number of conducting paths connected in series		1 / 2 / 3	
	up to 24 V	A	400 / 400 / 400	
	60 V	A	11 / 400 / 400	
	110 V	A	3 / 400 / 400	
	220 V	A	0.6 / 2.5 / 400	
	440 V	A	0.18 / 0.65 / 1.4	
	600 V	A	0.125 / 0.37 / 0.75	
Operating frequency				
Operating frequency *z* in operating cycles per hour				
Contactors without overload relays	No-load operating frequency	1/h	2000	2000
Dependence of the operating frequency *z'* on the operational current *I'* and the operational voltage *U'*:	for AC-1	1/h	700	500
	for AC-2	1/h	200	170
	for AC-3	1/h	500	420
	for AC-4	1/h	130	130
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h				
Contactors with overload relays (mean value)		1/h	60	60

Contactor	Size Type		S12 3RT10 7.
Conductor cross-sections			
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected / Back terminal connected / Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240 / 120 ... 185 / min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm²	70 ... 240 / 120 ... 185 / min. 2 × 50, max. 2 × 185
	Stranded	mm²	95 ... 300 / 120 ... 240 / min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil / 250 ... 500 kcmil / min. 2 × 2/0, max. 2 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8 / min. 6 × 9 × 0.8
		mm	max. 20 × 24 × 0.5 / max. 20 × 24 × 0.5 / max. 2 × (20 × 24 × 0.5)
	– Terminal screws		M 12 (hexagon socket, A/F 5)
	– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)
	Without box terminal/busbar connection		
	Finely stranded with cable lug	mm²	50 ... 240
	Stranded with cable lug	mm²	70 ... 240
			If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil
	Connecting bar (max. width)	mm	25
	– Terminal screws		M 10 × 30 (A/F 17)
	– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)
	Auxiliary conductor:		
	Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)
	– Terminal screws		M 3 (PZ 2)
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)



Technical data

Contactor / Size / Type				S10 3RT12 64	S10 3RT12 65	S10 3RT12 66
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.						
Mechanical endurance			Oper. cycles	10 million		
Electrical endurance				See page 2/125		
Rated insulation voltage U_i (pollution degree 3)			V	1000		
Rated impulse withstand voltage U_{imp}			kV	8		
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time				Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20		
Shock resistance	Rectangular pulse Sine pulse		*g*/ms *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections				See page 2/156		
Electromagnetic compatibility (EMC)				See page 2/108		
Short-circuit protection						
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660Part 102)	Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]		A A A	500 500 400		
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10		
Control circuit						
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$		
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism		Solid-state op. mechanism
				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing p.f. closed p.f.		VA VA 	530 0.9 6.1 0.9	630 0.9 7.4 0.9	420 0.8 4.3 0.8	570 0.8 5.6 0.8
DC operation	closing closed		W W	580 6.8	700 8.2	460 3.4	630 4.2
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA		
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time opening time		ms ms	30 ... 95 40 ... 80		105 ... 145 80 ... 100	45 ... 80 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time		ms ms	35 ... 50 50 ... 80		110 ... 130 80 ... 100	50 ... 65 80 ... 100
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

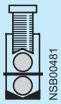
Contactor / Size / Type				S10 3RT12 64	S10 3RT12 65	S10 3RT12 66
Main circuit						
Load ratings with AC						
AC-1 utilization category, switching resistive load						
Rated operational currents I_e	at 40 °C up to 1000 V	A		330		
	at 60 °C up to 1000 V	A		300		
Ratings of three-phase loads [1] p.f. = 0.95 (at 60 °C)	at 230 V	kW		113		
	400 V	kW		197		
	500 V	kW		246		
	690 V	kW		340		
	1000 V	kW		492		
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C	mm²		185		
	60 °C	mm²		185		
AC-2 and AC-3 utilization categories						
Rated operational currents I_e	up to 1000 V	A		225	265	300
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		73	85	97
	400 V	kW		128	151	171
	500 V	kW		160	189	215
	690 V	kW		223	265	288
	1000 V	kW		320	378	428
Thermal loading capacity	10 s current [2]	A		1800	2120	2400
Power loss per conducting path	at I_e/AC-3	W		9	12	14
AC-4 utilization category (at $I_a = 6 \times I_e$)						
Rated operational current I_e	up to 690 V	A		195	230	280
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW		110	132	160
• For a contact endurance of approx. 400 000 operating cycles:						
Rated operational currents I_e	up to 690 V	A		97	115	140
	1000 V	A		68	81	98
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		30	37	45
	400 V	kW		55	65	79
	500 V	kW		68	81	98
	690 V	kW		94	112	138
	1000 V	kW		95	114	140
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20	
Rated operational current I_e	up to 690 V	A		185	278	
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA		74	111	
	400 V	kVA		128	193	
	500 V	kVA		160	241	
	690 V	kVA		221	332	
	1000 V	kVA		320	482	
$P_x = P_{n\,30} \cdot \frac{30}{x}$						
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C						
Rated operational currents I_e	up to 500 V	A		220		
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar		88		
	400 V	kvar		152		
	500 V	kvar		191		
	690 V	kvar		152		
Operating frequency						
Operating frequency *z* in operating cycles per hour						
Contactors without overload relays	No-load operating frequency	1/h		2000	2000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':	for AC-1	1/h		800	750	
	for AC-2	1/h		300	250	
	for AC-3	1/h		750	750	
	for AC-4	1/h		250	250	
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h						
Contactors with overload relays (mean value)		1/h		60	60	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

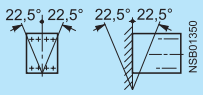
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Technical data

Contactor	Size Type		S10 3RT12 6.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 1 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm mm	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)
	– Terminal screws		M 12 (hexagon socket, A/F 5)		
	– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	70 ... 240		
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
	Connecting bar (max. width)	mm	25		
	– Terminal screws		M 10 × 30 (A/F 17)		
	– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
	Auxiliary conductor:				
	Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
	– Terminal screws		M 3 (PZ 2)		
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		



Technical data

Contactor	Size / Type			S12 3RT12 75	S12 3RT12 76
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance			Oper. cycles	10 million	
Electrical endurance				See page 2/125	
Rated insulation voltage U_i (pollution degree 3)			V	1000	
Rated impulse withstand voltage U_{imp}			kV	8	
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690	
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time				Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)	
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80	
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20	
Shock resistance	Rectangular pulse Sine pulse		*g*/ms *g*/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections				See page 2/159	
Electromagnetic compatibility (EMC)				See page 2/108	
Short-circuit protection					
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660Part 102)	Type of coord. "1" [1] Type of coord. "2" [1] Weld-free [2]		A A A	800 800 500	
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_K < 400$ A)			A	10	
Control circuit					
Coil voltage tolerance		AC/DC (UC)		$0.8 \times U_{s\,min}$ ... $1.1 \times U_{s\,max}$	
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism	Solid-state op. mechanism
				$U_{s\,min}$ / $U_{s\,max}$	$U_{s\,min}$ / $U_{s\,max}$
AC operation	closing p.f. closed p.f.		VA VA 	700 / 830 0.9 / 0.9 7.6 / 9.2 0.9 / 0.9	560 / 750 0.8 / 0.8 5.4 / 7 0.8 / 0.8
DC operation	closing closed		W W	770 / 920 8.5 / 10	600 / 800 4 / 5
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA	
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism	Solid-state op. mechanism Operation via A1/A2 / PLC input
– at $0.8 \times U_{s\,min}$ ... $1.1 \times U_{s\,max}$	closing time opening time		ms ms	45 ... 100 60 ... 100	120 ... 150 / 60 ... 90 80 ... 100 / 80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time opening time		ms ms	50 ... 70 70 ... 100	125 ... 150 / 65 ... 80 80 ... 100 / 80 ... 100
Arcing time			ms	10 ... 15	10 ... 15 / 10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Technical data

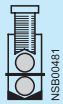
Contactor / Size / Type				S12 3RT12 75	S12 3RT12 76
Main circuit					
Load ratings with AC					
AC-1 utilization category, switching resistive load					
Rated operational currents I_e	at 40 °C up to 1000 V	A		610	
	at 60 °C up to 1000 V	A		550	
Ratings of three-phase loads [1] p.f. = 0.95 (at 60 °C)	at 230 V	kW		208	
	400 V	kW		362	
	500 V	kW		452	
	690 V	kW		624	
	1000 V	kW		905	
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C	mm^2		2 × 185	
	60 °C	mm^2		2 × 185	
AC-2 and AC-3 utilization categories					
Rated operational currents I_e	up to 1000 V	A		400	500
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		132	164
	400 V	kW		231	291
	500 V	kW		291	363
	690 V	kW		400	507
	1000 V	kW		578	728
Thermal loading capacity	10 s current [2]	A		3200	4000
Power loss per conducting path	at I_e/AC-3	W		21	32
AC-4 utilization category (at $I_a = 6 \times I_e$)					
Rated operational current I_e	up to 690 V	A		350	430
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW		200	250
• For a contact endurance of approx. 400 000 operating cycles:					
Rated operational currents I_e	up to 690 V	A		175	215
	1000 V	A		123	151
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW		56	70
	400 V	kW		98	122
	500 V	kW		124	153
	690 V	kW		172	212
	1000 V	kW		183	217
AC-6a utilization category, switching three-phase transformers with inrush			n	30	20
Rated operational current I_e	up to 690 V	A		279	419
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x: $P_x = P_{n\,30} \cdot \frac{30}{x}$	at 230 V	kVA		111	167
	400 V	kVA		193	290
	500 V	kVA		241	363
	690 V	kVA		332	501
	1000 V	kVA		482	726
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors Ambient temperature 40 °C					
Rated operational currents I_e	up to 500 V	A		407	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar		162	
	400 V	kvar		282	
	500 V	kvar		352	
	690 V	kvar		282	
Operating frequency					
Operating frequency *z* in operating cycles per hour					
Contactors without overload relays	No-load operating frequency	1/h		2000	
Dependence of the operating frequency z' on the operational current I' and the operational voltage U': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\ V}{U'}\right)^{1.5}$ 1/h	for AC-1	1/h		700	
	for AC-2	1/h		250	
	for AC-3	1/h		750	
	for AC-4	1/h		250	
Contactors with overload relays (mean value)		1/h		60	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

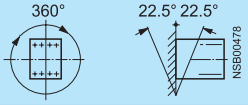
2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Technical data

Contactor	Size Type		S12 3RT12 7.		
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
	Stranded	mm²	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
	AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
	Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	
		mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)
	– Terminal screws		M 12 (hexagon socket, A/F 5)		
	– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)		
	Without box terminal/busbar connection				
	Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug	mm²	70 ... 240		
	AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
	Connecting bar (max. width)	mm	25		
	– Terminal screws		M 10 × 30 (A/F 17)		
	– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
	Auxiliary conductor: Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
	– Terminal screws		M 3 (PZ 2)		
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		



Technical data

Contactor	Size Type			**S3** **3RT24 46**
General data				
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.		AC and DC operation		360° 22.5° 22.5°  NSB00478 For DC operation and forward inclination up to 22.5°: coil voltage tolerance 0.85 ... 1.1 × U_s
Upright mounting position:				 NSB00477
		AC operation		Special design required. Positions 13 ... 16 of the Order No. must be changed to **-1AA0**. Additional charge.
		DC operation		–
Mechanical endurance			Oper. cycles	10 million
Electrical endurance AC-1 utilization category at I_e			Oper. cycles	0.5 million
Rated insulation voltage U_i (pollution degree 3)			V	1000
Rated impulse withstand voltage U_{imp}			kV	6
Safe isolation between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60 –55 ... +80
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 20 (terminal compartment IP 00), coil system IP 40
Shock resistance				
Rectangular pulse	AC and DC operation		*g*/ms	6.8/5 and 4/10
Sine pulse	AC and DC operation		*g*/ms	10.6/5 and 6.2/10
Conductor cross-sections				See page 2/162
Short-circuit protection of contactors without overload relays				
Main circuit				
Fuse links, utilization category gL/gG NH, Type 3NA		Type of coord. "1" [2]	A	250
Fuse links, utilization category gR SITOR, Type 3NE		Type of coord. "2" [2]	A	250
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE			A	10
or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10
Control circuit				
Coil voltage tolerance		AC/DC		0.8 ... 1.1 × U_s
Power consumption of the coils (with coil in cold state and 1.0 × U_s)				**Standard design** | **For USA and Canada**
AC operation			Hz	50 | 50/60 | 50 | 60
	closing p.f. closed p.f.		VA VA 	270 0.68 22 0.27 | 298 /274 0.7 / 0.62 27 / 20 0.29/ 0.31 | 270 0.68 22 0.27 | 300 0.52 21 0.29
DC operation	closing = closed		W	15
Operating times at 0.8 ... 1.1 × U_s [1] Break-time = opening time + arcing time				
AC operation	closing time opening time		ms ms	17 ... 90 10 ... 25
DC operation	closing time opening time		ms ms	90 ... 230 14 ... 20
Arcing time			ms	10 ... 15
Operating times at 1.0 × U_s [1]				
AC operation	closing time opening time		ms ms	18 ... 30 11 ... 23
DC operation	closing time opening time		ms ms	100 ... 120 16 ... 20

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks: varistor +2 ms to 5 ms, diode assemblies 2 to 6 times.

2) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

Technical data

Contactor	Size / Type			S3 3RT24 46		
Main circuit						
Load ratings with AC						
AC-1 utilization category, switching resistive load						
Rated operational currents I_e	at 40 °C up to 690 V		A	140		
	at 60 °C up to 690 V		A	130		
	at 1000 V		A	60		
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V		kW	50		
	400 V		kW	86		
	500 V		kW	107		
	690 V		kW	148		
	1000 V		kW	98		
Minimum conductor cross-section with $I_{e\ load}$	at 40 °C		mm²	50		
	at 60 °C		mm²	50		
AC-2 and AC-3 utilization categories With an electrical endurance of 1.3 million operating cycles						
Rated operational current I_e	up to 690 V		A	44		
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V		kW	12.7		
	400 V		kW	22		
	500 V		kW	29.9		
	690 V		kW	38.2		
Power loss per conducting path	at I_e/AC-1		W	12.5		
Load ratings with DC						
DC-1 utilization category, switching resistive load L/R ≤ 1 ms) Number of conducting paths when connected in series				1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V		A	130	130	130
	60 V		A	80	130	130
	110 V		A	12	130	130
	220 V		A	2.5	13	130
	440 V		A	0.8	2.4	6
	600 V		A	0.48	1.3	3.4
DC-3 and DC-5 utilization categories, shunt and series motors Number of conducting paths when connected in series				1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V		A	6	130	130
	60 V		A	3	130	130
	110 V		A	1.25	130	130
	220 V		A	0.35	1.75	4
	440 V		A	0.15	0.42	0.8
	600 V		A	0.1	0.27	0.45
Operating frequency						
Operating frequency *z* in operating cycles per hour				AC operation	DC operation	
Contactors without overload relays	No-load operating frequency		1/h	5000	1000	
Rated operation	for AC-1		1/h	650	650	
	for AC-3		1/h	1000	1000	

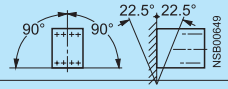
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1.5} \text{ 1/h}$$

Technical data

Contactor	Size Type		S3 3RT24 46		
Conductor cross-sections					
Screw connections (1 or 2 conductor connections possible)	**Main conductor:** With box terminal		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm²	2.5 ... 50	2.5 ... 50	max. 2×35
	Finely stranded without end sleeve	mm²	4 ... 50	10 ... 50	max. 2×35
	Solid	mm²	2.5 ... 16	2.5 ... 16	max. 2×16
	Stranded	mm²	4 ... 70	10 ... 70	max. 2×50
	Ribbon cable (qty. × width × thickness)	mm	6 × 9 × 0.8	6 × 9 × 0.8	2×(6×9×0.8)
	AWG conductor connections	AWG	10 ... 2/0	10 ... 2/0	2 × (10 ... 1/0)
	– Terminal screws		M 6 (hexagon socket)		
	– Tightening torque	Nm	4 ... 6 (36 ... 53 lb.in)		
Connection for drilled copper bars	max. width	mm	10	If bars larger than 12 × 10 mm are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance	
	Without box terminal with cable lugs				
	Finely stranded with cable lug	mm²	10 ... 50[1])	If conductors larger than 25 mm² are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance	
	Stranded with cable lug	mm²	10 ... 70[1])		
	AWG conductor connections, solid or stranded	AWG	7 ... 1/0		
	Auxiliary conductor:				
	Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 × (20 ... 16); 2 × (18 ... 14); 1 × 12		
	– Terminal screws		M 3		
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		

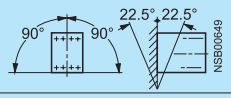
Technical data

Contactor / Size / Type				S6 3RT14 56
General data				
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.				
Mechanical endurance			Oper. cycles	10 million
Electrical endurance AC-1 utilization category at I_e			Oper. cycles	0.5 million
Rated insulation voltage U_i (pollution degree 3)			V	1000
Rated impulse withstand voltage U_{imp}			kV	8
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20
Shock resistance				
Rectangular pulse			*g*/ms	8.5/5 and 4.2/10
Sine pulse			*g*/ms	13.4/5 and 6.5/10
Conductor cross-sections				See page 2/164
Electromagnetic compatibility (EMC)				See page 2/108
Short-circuit protection				
Main circuit				
Fuse links, utilization category gL/gG, NH, Type 3NA	Type of coordination "1"		A	355
Fuse links, utilization category gR, SITOR, Type 3NE	Type of coordination "2"		A	350
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10
Control circuit				
Coil voltage tolerance	AC/DC (UC)			0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism: $U_{s\,min}$ / $U_{s\,max}$; Solid-state op. mechanism: $U_{s\,min}$ / $U_{s\,max}$
AC operation	closing		VA	250 / 300 / 190 / 280
	p.f.			0.9 / 0.9 / 0.8 / 0.8
	closed		VA	4.8 / 5.8 / 3.5 / 4.4
	p.f.			0.8 / 0.8 / 0.5 / 0.4
DC operation	closing		W	300 / 360 / 250 / 320
	closed		W	4.3 / 5.2 / 2.3 / 2.8
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism; Solid-state op. mechanism Operation via A1/A2; Solid-state op. mechanism Operation via PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time		ms	20 ... 95 / 95 ... 135 / 35 ... 75
	opening time		ms	40 ... 60 / 80 ... 90 / 80 ... 90
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time		ms	25 ... 50 / 100 ... 120 / 40 ... 60
	opening time		ms	40 ... 60 / 80 ... 90 / 80 ... 90
Arcing time			ms	10 ... 15 / 10 ... 15 / 10 ... 15
Main circuit				
Load ratings with AC				
AC-1 utilization category, switching resistive load				
Rated operational currents I_e	at 40 °C up to 690 V		A	275
	at 60 °C up to 690 V		A	250
	at 1000 V		A	100
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V		kW	95
	400 V		kW	165
	500 V		kW	205
	690 V		kW	285
	1000 V		kW	165
Minimum conductor cross-section with $I_{e\,load}$	at 40 °C		mm²	2 × 70
	at 60 °C		mm²	120
Power loss per conducting path	at I_e/AC-1		W	20

Technical data

Contactor / Size / Type				S6 3RT14 56		
Main circuit						
Load ratings with AC						
AC-2 and AC-3 utilization category With an electrical endurance of 1.3 million operating cycles						
Rated operational current I_e	up to 690 V	A		97		
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V	kW		30		
	400 V	kW		55		
	500 V	kW		55		
	690 V	kW		90		
Load ratings with DC						
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)						
Number of conducting paths connected in series				1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A		315	315	315
	60 V	A		315	315	315
	110 V	A		18	315	315
	220 V	A		3.4	20	315
	440 V	A		0.8	3.2	11.5
	600 V	A		0.5	1.6	4
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)						
Number of conducting paths connected in series				1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A		315	315	315
	60 V	A		7.5	315	315
	110 V	A		2.5	315	315
	220 V	A		0.6	2.5	315
	440 V	A		0.17	0.65	1.4
	600 V	A		0.12	0.37	0.75
Operating frequency						
Operating frequency *z* in operating cycles per hour						
Contactors without overload relays	No-load op. frequency	1/h		2000		
	for AC-1	1/h		600		
	for AC-3	1/h		1000		
Dependence of the operating frequency z' on the operational current I' and operational voltage U': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1.5}$ 1/h						
Conductor cross-sections						
Screw connections	**Main conductor:** with 3RT19 55-4G box terminal			Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve		mm²	10 ... 70	10 ... 70	max. 1×50, 1×70
	Finely stranded without end sleeve		mm²	10 ... 70	10 ... 70	max. 1×50, 1×70
	Stranded		mm²	16 ... 70	16 ... 70	max. 2 × 70
	AWG conductor connections, solid or stranded			6 ... 2/0	6 ... 2/0	max. 2 × 1/0
	Ribbon cable (qty. × width × thickness)		mm	min. 3 × 9 × 0.8	min. 3 × 9 × 0.8	
			mm	max. 6 × 15.5 × 0.8	max. 6 × 15.5 × 0.8	max. 2 × (6 × 15.5 × 0.8)
	with 3RT19 56-4G box terminal					
	Finely stranded with/without end sleeve		mm²	10 ... 120	10 ... 120	max. 1 × 95, 1 × 120
	Stranded		mm²	16 ... 120	16 ... 120	max. 2 × 120
	AWG conductor connections, solid or stranded		AWG	6 ... 250 kcmil	6 ... 250 kcmil	max. 2 × 3/0
	Ribbon cable (qty. × width × thickness)		mm	min. 3 × 9 × 0.8	min. 3 × 9 × 0.8	
			mm	max. 10 × 15.5 × 0.8	max. 10 × 15.5 × 0.8	max. 2 × (10 × 15.5 × 0.8)
	– Terminal screws			M 10 (hexagon socket, A/F4)		
	– Tightening torque		Nm	10 ... 12 (90 ... 110 lb.in)		
	Without box terminal/busbar connection					
	Finely stranded with cable lug		mm²	16 ... 95	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm² a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.	
	Stranded with cable lug		mm²	25 ... 120		
	AWG conductor connections, solid or stranded		AWG	4 ... 250 kcmil		
	Connecting bar (max. width)		mm	17		
	– Terminal screws			M 8 × 25 (A/F 13)		
	– Tightening torque		Nm	10 ... 14 (89 ... 124 lb.in)		
	Auxiliary conductor:					
	Solid		mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
	Finely stranded with end sleeve		mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded		AWG	2 × (18 ... 14)		
	– Terminal screws			M 3 (PZ2)		
	– Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		

Technical data

Contactor / Size / Type				S10 3RT14 66	S12 3RT14 76
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance			Oper. cycles	10 million	
Electrical endurance AC-1 utilization category at I_e			Oper. cycles	0.5 million	
Rated insulation voltage U_i (pollution degree 3)			V	1000	
Rated impulse withstand voltage U_{imp}			kV	8	
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])			V	690	
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80	
Degree of protection acc. to IEC 60 947-1 and DIN 40 050				IP 00/open type, coil system IP 20	
Shock resistance Rectangular pulse Sine pulse			 *g*/ms *g*/ms	 8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections				See page 2/167	
Electromagnetic compatibility (EMC)				See page 2/108	
Short-circuit protection					
Main circuit					
Fuse links, utilization category gL/gG, NH, Type 3NA		Type of coordination "1"	A	500	800
Fuse links, utilization category gR, SITOR, Type 3NE		Type of coordination "2"	A	500	710
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10	

Contactor / Size / Type				S10 3RT14 66			
Control circuit							
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism				Conventional op. mechanism		Solid-state op. mechanism	
(with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing		VA	490	590	400	530
	p.f.			0.9	0.9	0.8	0.8
	closed		VA	5.6	6.7	4	5
	p.f.			0.9	0.9	0.5	0.4
DC operation	closing		W	540	650	440	580
	closed		W	6.1	7.4	3.2	3.8
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA			
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time		ms	30 ... 95		105 ... 145	45 ... 80
	opening time		ms	40 ... 80		80 ... 200	80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time		ms	35 ... 50		110 ... 130	50 ... 65
	opening time		ms	50 ... 80		80 ... 100	80 ... 100
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

Technical data

Contactor	Size / Type			S12 3RT14 76			
Control circuit							
Coil voltage tolerance		AC/DC (UC)		0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s\,min}$ ... $U_{s\,max}$)				Conventional op. mechanism		Solid-state op. mechanism	
				$U_{s\,min}$	$U_{s\,max}$	$U_{s\,min}$	$U_{s\,max}$
AC operation	closing		VA	700	830	560	750
	p.f.			0.9	0.9	0.8	0.8
	closed		VA	7.6	9.2	5.4	7
	p.f.			0.9	0.9	0.8	0.8
DC operation	closing		W	770	920	600	800
	closed		W	8.5	10	4	5
PLC control input (EN 61 131-2/Type 2)				DC 24 V/≤ 30 mA			
Operating times (Break-time = opening time + arcing time)				Conventional op. mechanism		Solid-state op. mechanism Operation via A1/A2	PLC input
– at 0.8 × $U_{s\,min}$ ... 1.1 × $U_{s\,max}$	closing time		ms	45 ... 100		120 ... 150	60 ... 90
	opening time		ms	60 ... 100		80 ... 100	80 ... 100
– at $U_{s\,min}$ ... $U_{s\,max}$	closing time		ms	50 ... 70		125 ... 150	65 ... 80
	opening time		ms	70 ... 100		80 ... 100	80 ... 100
Arcing time			ms	10 ... 15		10 ... 15	10 ... 15

Contactor	Size / Type			S10 3RT14 66			S12 3RT14 76		
Main circuit									
Load ratings with AC									
AC-1 utilization category, switching resistive load									
Rated operational currents I_e	at 40 °C up to 690 V		A	400			690		
	at 60 °C up to 690 V		A	380			650 [1])		
	at 1000 V		A						
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V		kW	145			245		
	400 V		kW	250			430		
	500 V		kW	315			535		
	690 V		kW	430			740		
	1000 V		kW						
Minimum conductor cross-section with $I_{e\,load}$	at 40 °C		mm²	240			2 × 240		
	at 60 °C		mm²	240			2 × 240		
Power loss per conducting path	at I_e/AC-1		W	27			55		
AC-2 and AC-3 utilization categories With an electrical endurance of 1.3 million operating cycles									
Rated operational current I_e	up to 690 V		A	138			170		
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V		kW	37			55		
	400 V		kW	75			90		
	500 V		kW	90			110		
	690 V		kW	132			160		
Load ratings with DC									
DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)	Number of conducting paths connected in series			1	2	3	1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V		A	380	380	380	500	500	500
	60 V		A	380	380	380	500	500	500
	110 V		A	33	380	380	33	500	500
	220 V		A	3.8	380	380	3.8	500	500
	440 V		A	0.9	4	11	0.9	4	11
	600 V		A	0.6	2	5.2	0.6	2	5.2
DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)	Number of conducting paths connected in series			1	2	3	1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V		A	380	380	380	500	500	500
	60 V		A	11	380	380	11	500	500
	110 V		A	3	380	380	3	500	500
	220 V		A	0.6	2.5	380	0.6	2.5	500
	440 V		A	0.18	0.65	1.4	0.18	0.65	1.4
	600 V		A	0.125	0.37	0.75	0.125	0.37	0.75

1) Ambient temperature 50 °C for 3RT14 76-.N contactor

Technical data

Contactor	Size Type			S10 3RT14 66	S12 3RT14 76
Main circuit					
Operating frequency					
Operating frequency *z* in operating cycles per hour					
Contactors without overload relays		No-load op. frequency for AC-1 for AC-3	1/h 1/h 1/h	2000 600 1000	
Dependence of the operating frequency z' on the operational current I' and operational voltage U': $z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400\,V}{U'}\right)^{1.5}$ 1/h					
Conductor cross-sections					
Screw connections	**Main conductor:** with 3RT19 66-4G box terminal			Front terminal connected	Back terminal connected	Both terminals connected
		Finely stranded with end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
		Finely stranded without end sleeve	mm²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185
		Stranded	mm²	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240
		AWG conductor connections, solid or stranded		3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil
		Ribbon cable (qty. × width × thickness)	mm mm	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)
		– Terminal screws		M 12 (hexagon socket, A/F 5)		
		– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)		
	Without box terminal/busbar connection					
		Finely stranded with cable lug	mm²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and DIN 46 235 as of a conductor cross-section of 185 mm², a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
		Stranded with cable lug	mm²	70 ... 240		
		AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil		
		Connecting bar (max. width)	mm	25		
		– Terminal screws		M 10 × 30 (A/F 17)		
		– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)		
	Auxiliary conductor:					
		Solid	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)		
		Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)		
		AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)		
		– Terminal screws		M 3 (PZ3)		
		– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		

More information

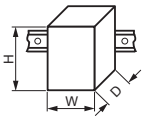
Contactors	Type		3RT23 16	3RT23 17	3RT23 25	3RT23 26	3RT23 27
	Size		S00		S0		
Dimensions (W x H x D)[3]	Width	mm	45 x 57.5 x 73		60 x 85 x 97		
General data							
Permissible mounting position[1]							
Mechanical endurance		Operating cycles	30 million		10 million		
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million				
Rated insulation voltage U_i (pollution degree 3)		V	690				
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80				
Degree of protection Acc. to EN 60947-1, Appendix C	Device Connection range		IP20				IP20 IP00
Touch protection acc.to EN 50274			Finger-safe				
Short-circuit protection of contactors without overload relays							
Main circuit Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1	• Type of coordination "1"[1] • Type of coordination "2"[1] • Weld-free	A A A	35 20 10		63 20 16		
Control							
Solenoid coil operating range							
• AC operation	- At 50 Hz - At 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• DC operation	- At 50 °C - At 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• AC/DC operation			--		0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing - P.f. - Closed - P.f.	VA VA 	-- -- -- --		77 0.82 9.8 0.25		
• AC operation, 50/60 Hz, standard version	- Closing - P.f. - Closed - P.f.	VA VA 	27/24.3 0.8/0.75 4.2/3.3 0.25/0.25	37/33 0.8/0.75 5.7/4.4 0.25/0.25	81/79 0.72/0.74 10.5/8.5 0.25/0.28		
• AC operation, 60 Hz, USA, Canada	- Closing - P.f. - Closed - P.f.	VA VA 	31.7 0.77 4.8 0.25	43 0.77 6.5 0.25	87 0.76 9.4 0.28		
• DC operation	- Closing = Closed	W	4		5.9		
Operating times for 0.8 ... 1.1 x U_s[2] Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay - Opening delay	ms ms	8 ... 35 3.5 ... 14	8 ... 33 4 ... 15	9 ... 38 4 ... 16	8 ... 40 4 ... 16	
• DC operation	- Closing delay - Opening delay	ms ms	30 ... 100 7 ... 13		50 ... 170 15 ... 17.5		
• Arcing time		ms	10 ... 15		10		
Main circuit							
AC capacity							
Utilization category AC-1, switching resistive loads							
• Rated operational currents I_e	At 40 °C, up to 690 V At 60 °C, up to 690 V	A A	18 16	22 20	35 30	40 35	50 42
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 460 V	HP	5	5	10	10	10
• Minimum conductor cross-section for loads with I_e	At 40 °C At 60 °C	mm^2 mm^2	2.5 2.5	2.5 2.5	10 10	10 10	10 10
Utilization category AC-3							
• Rated operational currents I_e	At 60 °C, up to 400 V	A	9	12	15.5	17	17
• Rated power for slipring or squirrel-cage motors at 60 Hz	At 460 V	HP	5	5	10	10	10

[1] In accordance with the corresponding 3-pole 3RT2. contactors.

[2] With size S00, DC operation: Operating times at 0.85 ... 1.1 x U .

[3] Dimensions for devices with screw terminals. Size S0 for AC operation. DC operation: Depth + 10mm.

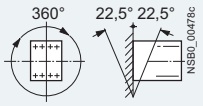
Technical specifications

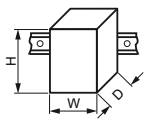


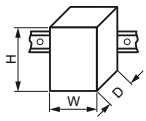
			3RT23 36	3RT23 44	3RT23 46
Type					
Size			S2	S3	S3
Dimensions (W x H x D)		mm	74.5 x 113.5 x 130 / 74.5 x 113.5 x 130	73 x 112 x 110	93 x 146 x 134
• With mounted auxiliary switch block		mm	74.5 x 113.5 x 173.5 / 74.5 x 113.5 x 177.5	73 x 112 x 160	93 x 146 x 183
General technical specifications					
Permissible mounting position[1]					
Mechanical endurance		Operating cycles	10 million		
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million		
Rated insulation voltage U_i (pollution degree 3)		V	690		
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C	Device		IP20		
	Connection range				
Touch protection acc. to EN 50274			Finger-safe		
Short-circuit protection of contactors without overload relays					
Main circuit					
Fuse links, operational class gG:	• Type of coordination "1"[1]	A	on request	250	250
LV HRC, 3NA; DIAZED, 5SB; NEOZED, 5SE	• Type of coordination "2"[1]	A	on request	125	160
according to IEC 60947-4-1/EN 60947-4-1	• Weld-free	A	on request	63	100
Control circuit					
Coil operating range (AC/DC)			0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)					
• AC operation, 50 Hz	- Closing	VA	190	270	
	- P.f.	VA	0.72	0.68	
	- Closed	VA	16	22	
	- P.f.	VA	0.37	0.27	
• AC operation, 50/60 Hz	- Closing	VA	210/188	298/274	
	- P.f.		0.69/0.65	0.72/0.62	
	- Closed	VA	17.2/16.5	27/20	
	- P.f.		0.36/0.3	0.29/0.31	
• DC operation	- Closing = Closed	W		15	
Operating times for 0.8 ... 1.1 x U_s[2] Total break time = Opening delay + Arcing time					
• DC operation	- Closing delay	ms		110 ... 200	
	- Opening delay	ms		14 ... 20	
• AC operation	- Closing delay	ms	10 ... 80	20 ... 50	
	- Opening delay	ms	10 ... 18	10 ... 25	
• Arcing time		ms	10 ... 20	10 ... 15	
Main circuit					
AC capacity					
Utilization category AC-1, switching resistive loads					
• Rated operational currents I_e	At 40 °C, up to 690 V	A	60	110	140
	At 60 °C, up to 690 V	A	55	100	120
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 230 V	kW	21	42	53
	400 V	kW	36	72	92
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm²	16	50	50
	At 60 °C	mm²	25	50	50
Utilization categories AC-2 and AC-3					
• Rated operational currents I_e	At 60 °C, up to 400 V	A		--	--
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW		--	--
	400 V	kW		--	--

[1] In accordance with the corresponding 3-pole 3RT1 contactors.
[2] With size S00, DC operation: Operating times for 0.85 ... 1.1 x U_s

Technical specifications

Type		3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536
Size		S00			S0	S2	
General technical specifications							
Permissible mounting position							
The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position		 Special version required					
Mechanical endurance	Operating cycles	30 million			10 million		
Electrical endurance at I_e/AC-1	Operating cycles	Approx. 0.5 million					
Rated insulation voltage U_i (Pollution degree 3)	V	690					
Permissible ambient temperature							
• During operation	°C	-25 ... +60				-25 ... +60	
• During storage	°C	-55 ... +80				-55 ... +80	
Degree of protection acc. to IEC 60947-1, Appendix C		IP20					
Touch protection acc. to EN 50274		Finger-safe					
Short-circuit protection							
Main circuit							
Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1							
• Type of coordination "1"	A	35			63	125	160
• Type of coordination "2"	A	20			35	63	80
• Weld-free	A	10			16	--	--

Type			3RT2516	3RT2517	3RT2518	3RT2536	3RT2537
Size			S00			S2	
Dimensions (W x H x D)[1]			45 x 57.5 x 73 / 45 x 70 x 73			74.5 x 113.5 x 130 / 74.5 x 113.5 x 130	
• with mounted auxiliary switch block			45 x 57.5 x 116 / 45 x 70 x 121			74.5 x 113.5 x 173.5 / 74.5 x 113.5 x 177.5	

Type			3RT2526
Size			S0
Dimensions (W x H x D) for AC operation[1][2]		mm	60 x 85 x 97 / 60 x 101.5 x 97
• with mounted auxiliary switch block		mm	60 x 85 x 141 / 60 x 101.5 x 144
Dimensions (W x H x D) for DC operation[1][2]		mm	60 x 85 x 107 / 60 x 101.5 x 107
• with mounted auxiliary switch block		mm	60 x 85 x 151 / 60 x 101.5 x 154

1) Dimensions for devices with screw terminals/spring-type terminals.
2) For size S0, devices for AC and DC operation differ in depth. The following applies: Depth (DC) = Depth (AC) + 10 mm.

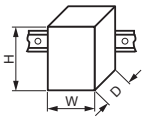
Type				3RT2516	3RT2517	3RT2518	3RT2526		3RT2535	3RT2536
Size				S00			S0		S2	
Control circuit										
Solenoid coil operating range										
• AC operation	at 50 Hz			0.8 ... 1.1 x U_s			0.8 ... 1.1 x U_s			
	at 60 Hz			0.85 ... 1.1 x U_s			0.8 ... 1.1 x U_s			
• DC operation	up to 50 °C			0.8 ... 1.1 x U_s					--	
	up to 60 °C			0.85 ... 1.1 x U_s					--	
• AC/DC operation				--					0.8 x U_{smin}... 1.1 x U_{smax}	
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)				see 3RT2316	see 3RT2317		see 3RT2326		see 3RT233	
Operating times for 0.8 to 1.1 x U_s (Total break time = Opening delay + Arcing time)				see 3RT2316	see 3RT2317		see 3RT2326		see 3RT233	
Main circuit										
Load rating with AC										
Utilization category AC-1 Switching resistive loads										
• Rated operational currents I_e	at 40 °C up to 690 V		A	18	22		40		60	70
	at 60 °C up to 690 V		A	16	20		35		55	60
• Rated power for AC loads p.f. = 0.95 (at 60 °C)	at 230 V		kW	6	7.5		13.3		21	23
	400 V		kW	10.5	13		23		36	39
• Minimum conductor cross-section for loads with I_e	at 40 °C		mm^2	2.5	2.5		10		16	25
Utilization categories AC-2 and AC-3							AC[1]	DC[1]		
• Rated operational currents I_e (at 60 °C)	NO up to 400 V		A	9	12	16	25	25	35	41
	NC up to 400 V		A	9	9	9	25	20	35	41
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	NO at 230 V		kW	2.2	3	4	5.5	5.5	11	
	NC at 230 V		kW	2.2	2.2	2.2	5.5	5.5	11	
	NO at 400 V		kW	4	5.5	7.5	11	11	18.5	22
	NC at 400 V		kW	4	4	4	11	7.5	18.5	22
Load rating with DC										
Utilization category DC-1 Switching resistive loads ($L/R \leq 1$ ms)										
• Rated operational currents I_e (at 60 °C)										
- 1 conducting path	up to 24 V		A	16	20		35		55	60
	60 V		A	16	20		20		23	
	110 V		A	2.1	2.1		4.5		4.5	
	220 V		A	0.8	0.8		1		1	
	440 V		A	0.6	0.6		0.4		0.4	
- 2 conducting paths in series	up to 24 V		A	16	20		35		55	
	60 V		A	16	20		35		45	
	110 V		A	12	12		35		45	
	220 V		A	1.6	1.6		5		5	
	440 V		A	0.8	0.8		1		1	
Utilization category DC-3/DC-5[2] Shunt-wound and series-wound motors ($L/R \leq 15$ ms)										
• Rated operational currents I_e (at 60 °C)										
- 1 conducting path	up to 24 V		A	16	20		20		35	
	60 V		A	0.5	0.5		5		6	
	110 V		A	0.15	0.15		2.5		2.5	
	220 V		A	0.75	0.75		1		1	
	440 V		A	--	--		0.09		0.1	
- 2 conducting paths in series	up to 24 V		A	16	20		35		55	
	60 V		A	5	5		35		45	
	110 V		A	0.35	0.35		15		25	
	220 V		A	--	--		3		5	
	440 V		A	--	--		0.27		0.27	

1) Values for devices with AC and DC operation: for 3RT25 26 with DC operation, different values apply to AC-2 and AC-3 for the NC.

2) For U_s >24 V, the rated operational currents I_e for the NC contact conducting paths are 50 % of the values for the NO contact conducting paths.

Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RT10 17 contactors for size S00, to those of the 3RT10 26 contactors for size S0 and to those of the 3RT10 45 contactors for size S3.

			3RT16 17-.A..3	3RT16 27-.A..1	3RT16 47-.A..1
Type					
Size			**S00**	**S0**	**S3**
Dimensions (W x H x D) including auxiliary switches and connecting cables		mm	45 x 101 x 105	45 x 100 x 130	70 x 167 x 183
General technical specifications					
Capacitor rating at rated power (utilization category AC-6b)	230 V, 50/60 Hz	kvar	3 … 7.5	3.5 … 15	3.5 … 30
	400 V, 50/60 Hz	**kvar**	**5 … 12.5**	**6 … 25**	**5 … 50**
	525 V, 50/60 Hz	kvar	7.5 … 15	7.8 … 30	7.5 … 60
	690 V, 50/60 Hz	kvar	10 … 21	10 … 42	10 … 84
Auxiliary contacts mounted (unassigned)			1 NO + 1 NC	1 NO	
Auxiliary contacts mountable (lateral), not for sizes S00 and S0			--		2 NC + 2 NO or 1 NO + 1 NC
Max. switching frequency		h^{-1}	180	100	
Electrical endurance		Operating cycles	> 250000	> 150000	> 100000
Ambient temperature		°C	60		
Short-circuit protection			1.6 ... 2.2 x I_e		
Coil operating range			0.8 … 1.1 x U_s		
Conductor cross-sections (1 or 2 conductors connectable)					
Main conductors			**Screw terminals**		
• Solid		mm²	2 x (0.5 ... 1.5)[2]; 2 x (0.75 ... 2.5)[2] according to IEC 60947; max. 2 x (1 ... 4)[2]	2 x (1 ... 2.5)[2]; 2 x (2.5 ... 6)[2] according to IEC 60947; max. 1 x 10 [1)2)]	--
• Finely stranded with end sleeve		mm²	2 x (0.5 ... 1.5)[2]; 2 x (0.75 ... 2.5)[2]	2 x (1 ... 2.5)[2]; 2 x (2.5 ... 6) [1)2)]	--
• AWG cables					
- Solid		AWG	2 x (20 ... 16)	2 x (16 ... 12)	--
- Solid or stranded		AWG	2 x (18 ... 14)	2 x (14 ... 10)	--
- Stranded		AWG	1 x 12	1 x 8	--
• Terminal screws			M3	M4 (Pozidriv size 2)	--
- Tightening torque		Nm	0.8 ... 1.2	2 ... 2.5	--
		lb.in	7 ... 10.3	18 ... 22	--

1) 3RV19 25-5AB feeder terminal for 16 mm².

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

More information

All technical specifications not mentioned in the table below are identical to those of the 3RT20 contactors for switching motors (see 2/130-2/132)

Contactors	Type		3RT20 1.-.HB4.	3RT20 1.-.JB4.	3RT20 1.-.KB4.	3RT20 2.-.KB4.
	Size		S00	S00	S00	S0
	Width	mm	45	45	45	45
General data						
Mechanical endurance		Operating cycles	30 million			10 million
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
Solenoid coil operating range			0.7 ... 1.25 x U_s			
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 17 V	W	1.6			2.3
	24 V	W	2.8			4.5
	30 V	W	4.4			7
Permissible residual current of the electronics (for 0 signal)			< 10 mA x (24 V/U_s)			< 6 mA x (24 V/U_s)
Overvoltage configuration of the solenoid coil			Without overvoltage damping 	With diode 	With suppressor diode 	With varistor 
Operating times of the coupling contactors						
• Closing						
- At 17 V	ON-delay NO	ms	40 ... 130			70 ... 270
	OFF-delay NC	ms	30 ... 80			60 ... 250
- At 24 V	ON-delay NO	ms	35 ... 60			65 ... 90
	OFF-delay NC	ms	25 ... 40			55 ... 80
- At 30 V	ON-delay NO	ms	25 ... 50			52 ... 65
	OFF-delay NC	ms	15 ... 30			43 ... 57
• Closing at 17 ... 30 V	OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20	19 ... 21
	ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30	25 ... 31

Contactors	Type		3RT20 1.-1MB4.-0KT0	3RT20 1.-1VB4.	3RT20 1.-1WB4.
	Size		S00	S00	S00
	Width	mm	45	45	45
General data					
Mechanical endurance		Operating cycles	30 million		
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400		
Control					
Solenoid coil operating range			0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 24 V	W	1.6		
Permissible residual current, upright mounting position			On request		
Overvoltage configuration of the solenoid coil			Without overvoltage damping 	With diode 	With suppressor diode 
Operating times of the coupling contactors					
• Closing					
- At 20.5 V	ON-delay NO	ms	30 ... 120		
	OFF-delay NC	ms	20 ... 110		
- At 24 V	ON-delay NO	ms	25 ... 90		
	OFF-delay NC	ms	15 ... 80		
- At 44 V	ON-delay NO	ms	15 ... 60		
	OFF-delay NC	ms	10 ... 50		
• Opening	OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20
	ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30

Overview

Standards

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1,
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

The 3TF68/69 contactors are climate-proof.

They are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices (see Accessories and Spare Parts on page 2/56).

Main contacts

Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base. If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, then the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters simultaneously.

Auxiliary contacts

Contact reliability

These auxiliary contacts are particularly suitable for solid-state circuits with currents ≥ 1 mA at a voltage ≥ 17 V.

Electromagnetic compatibility

The 3TF68/69..-.**C** contactors for AC operation are fitted with an electronically controlled solenoid operating mechanism with a high interference immunity (for EMC values see page 3/115). The solenoid coil is connected to varistors for protection against overvoltages.

The 3TF68/69..-.**Q**.. contactors for AC operation are designed for operation in systems with AC control supply voltage which is subject to strong interference. The solenoid systems of these contactors are configured in the DC economy circuit with rectification. The rectifier bridge is connected to varistors for protection against overvoltages.

Protection of the main current paths

An integrated RC varistor connection for the main current paths dampens the switching overvoltage rises to safe values. This prevents multiple restricting. It can therefore be assumed that the motor winding cannot be damaged by switching overvoltages with steep voltage rises.

Note:

During operation in installations in which the emitted interference limits cannot be observed, e.g. when used for output contactors in converters, 3TF68/69..-.**Q** contactors without a main current path circuit are recommended.

Technical specifications

Contactor	Type	3TF68 and 3TF69		
Rated data of the auxiliary contacts		Acc. to IEC 60947-5-1		
Rated insulation voltage U_i (pollution degree 3)	V	690		
Conventional thermal current I_{th} = Rated operational current I_e/AC-12	A	10		
AC load **Rated operational current I_e/AC-15/AC-14** • For rated operational voltage U_e				
- At 24 V	A	10		
- At 110 V	A	10		
- At 125 V	A	10		
- At 220 V	A	6		
- At 230 V	A	5.6		
- At 380 V	A	4		
- At 400 V	A	3.6		
- At 500 V	A	2.5		
- At 660 V	A	2.5		
- At 690 V	A	2.3		
DC load **Rated operational current I_e/DC-12** • For rated operational voltage U_e				
- At 24 V	A	10		
- At 60 V	A	10		
- At 110 V	A	3.2		
- At 125 V	A	2.5		
- At 220 V	A	0.9		
- At 440 V	A	0.33		
- At 600 V	A	0.22		
Rated operational current I_e/DC-13 • For rated operational voltage U_e			Auxiliary contacts with delayed NC contact:	NS = No specification
- At 24 V	A	10	6	
- At 60 V	A	5	NS	
- At 110 V	A	1.14	0.98	
- At 125 V	A	0.98	NS	
- At 220 V	A	0.48	NS	
- At 440 V	A	0.13	NS	
- At 600 V	A	0.07	0.07	
CSA and UL rated data of the auxiliary contacts				
Rated voltage, max.	V AC	600		
Switching capacity		A 600, P 600		

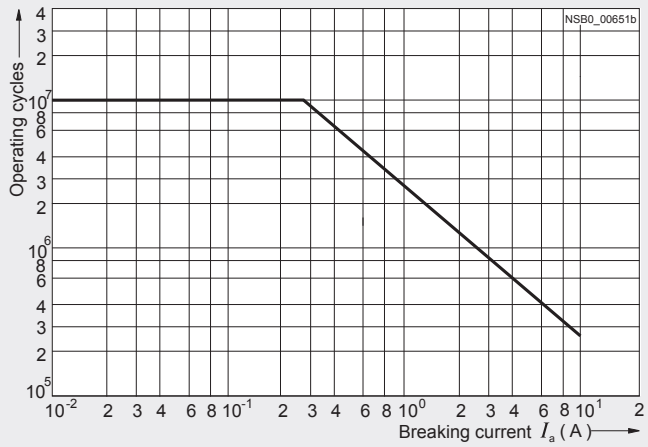
Contactor

Contact endurance of the auxiliary contacts

The contact endurance for utilization category AC-12 or AC-15/AC-14 depends mainly on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The characteristic curves apply to 230 V AC.

3TF68 and 3TF69



Contact erosion indication with vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base.

If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters.

3TF68 and 3TF69

Contact endurance of the main contacts

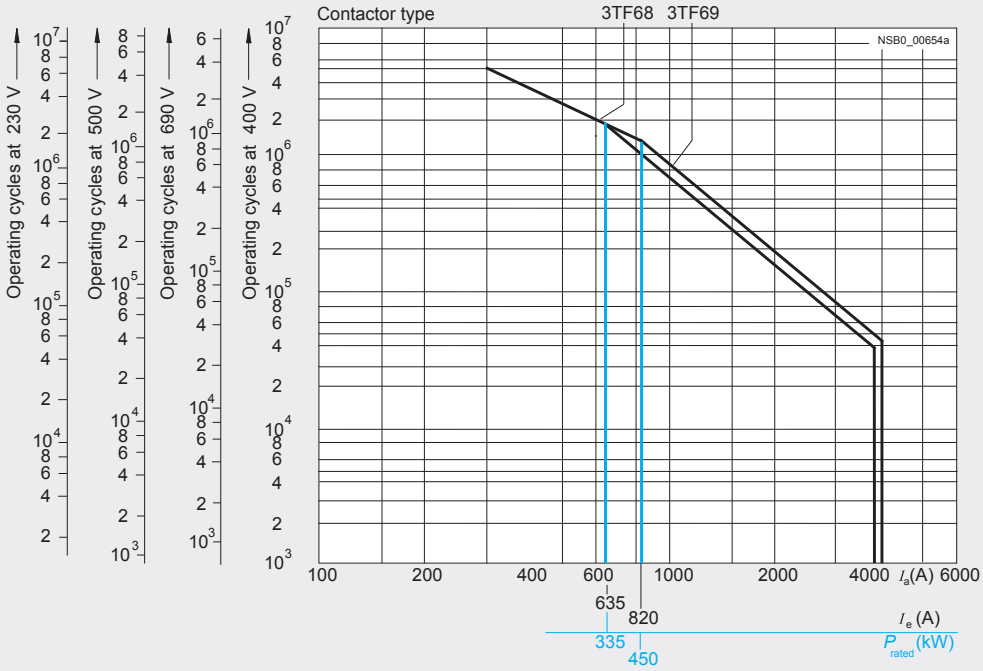
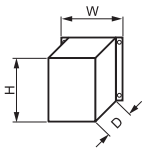
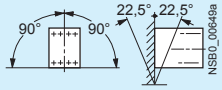


Diagram legend:
P_{rated} = Rated power for squirrel-cage motors at 400 V
I_a = Breaking current
I_e = Rated operational current

Type			**3TF68**	**3TF69**
Size			**14**	**14**
Dimensions (W x H x D)		mm	230 x 276 x 237	230 x 295 x 237
General data				
Permissible mounting position, installation instructions[1) 2)] The contactors are designed for operation on a vertical mounting surface.				
Mechanical endurance		Operating cycles	5 million	
Electrical endurance		Operating cycles	[3)]	
Rated insulation voltage U_i (pollution degree 3)		kV	1	
Rated impulse withstand voltage U_{imp}		kV	8	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N		kV	1	
Mirror contacts A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact. One NC contact each must be connected in series for the right and left auxiliary switch block respectively.			Yes, acc. to IEC 60947-4-1, Appendix F	
Permissible ambient temperature				
• During operation[5)]		°C	-25 ... +55	
• During storage		°C	-55 ... +80	
Degree of protection acc. to IEC 60947-1, Appendix C			IP00/open (where applicable, use additional terminal covers)	
Touch protection acc. to EN 50274			Finger-safe with cover	
Shock resistance				
• Rectangular pulse				
- AC operation		*g*/ms	8.1/5 and 4.7/10	9.5/5 and 5.7/10
- DC operation		*g*/ms	9/5 and 5.7/10	8.6/5 and 5.1/10
• Sine pulse				
- AC operation		*g*/ms	12.8/5 and 7.4/10	13.5/5 and 7.8/10
- DC operation		*g*/ms	14.4/5 and 9.1/10	13.5/5 and 7.8/10
Conductor cross-sections			See page 2/179.	
Electromagnetic compatibility (EMC)			See page 2/108.	
Short-circuit protection				
Main circuit Fuse links, gG operational class: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1				
• Type of coordination "1"		A	1000	1250
• Type of coordination "2"		A	500	630
• Weld-free[4)]		A	400	500
Auxiliary circuit				
• Short-circuit test with fuse links of gG operational class: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE with I_k = 1 kA acc. to IEC 60947-5-1		A	10	
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current I_k = 400 A acc. to IEC 60947-5-1		A	10	

1) To easily replace the laterally mounted auxiliary switches it is recommended to maintain a minimum distance of 30 mm between the contactors.

2) If mounted at a 90° angle (conducting paths are horizontally above each other), the switching frequency is reduced by 80% compared with the normal values.

3) See "Endurance of the auxillary contacts", page 2/175.

4) Test conditions according to IEC 60947-4-1.

5) For ambient temperatures > 55°C, only 3TF6.33-.Q..-Z A02 contactors (= without connection of the main current path circuits) can be used. Then derating is also possible with these contactors:
- AC-1: I_e = 782 A, 644 operating cycles/h;
- AC-3: operating range 0.85-1.05 x Us, 460 operating cycles/hour, mechanical endurance 5 million operating cycles, lateral clearance 10 mm

Contactor		Type	3TF68	3TF69
		Size	14	14
Control				
Coil operating range			0.8 x $U_{s\ min}$ ... 1.1 x $U_{s\ max}$	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)				
• AC operation, $U_{s\ max}$	- Closing	VA/p.f.	1850/1	950/0.98
	- Closed	VA/p.f.	49/0.15	30.6/0.31
• AC operation, $U_{s\ min}$	- Closing	VA/p.f.	1200/1	600/0.98
	- Closed	VA/p.f.	13.5/0.47	12.9/0.43
• DC economy circuit[1]	- Closing at 24 V	W	1010	960
	- Closed	W	28	20.6
For contactors of type 3TF68/69..-.**Q**:				
• AC operation, $U_{s\ min}$[2]	- Closing	VA/p.f.	1000/0.99	1150/0.99
	- Closed	VA/p.f.	11/1	11/1
Operating times for 0.8 ... 1.1 x U_s (Total break time = Opening delay + Arcing time)			(Values apply to cold and warm coil)	
• AC operation	- Closing delay	ms	70 ... 120 (22 ... 65)[3]	80 ... 120
	- Opening delay	ms	70 ... 100	70 ... 80
• DC economy circuit	- Closing delay	ms	76 ... 110	86 ... 280
	- Opening delay	ms	50	19 ... 25
• Arcing time		ms	10 ... 15	10
For contactors of type 3TF68/69..-.**Q**:				
• AC operation	- Closing delay	ms	35 ... 90	45 ... 160
	- Opening delay	ms	65 ... 90	30 ... 80
Operating times for 1.0 x U_s (Total break time = Opening delay + Arcing time)				
• AC operation	- Closing delay	ms	80 ... 100 (30 ... 45)[3]	85 ... 100
	- Opening delay	ms	70 ... 100	70
• DC economy circuit	- Closing delay	ms	80 ... 90	90 ... 125
	- Opening delay	ms	50	19 ... 25
Minimum command duration for closing	Standard	ms	120	120
	Reduced make-time	ms	90	--
Minimum interval time between two ON commands		ms	100	300

[1] At 24 V DC; for further voltages, deviations of up to ±10 % are possible.
[2] Including reversing contactor.
[3] Values in brackets apply to contactors with reduced operating times.

Contactor	Type	3TF6. 44-.CF7	3TF6. 44-.CM7	3TF6. 44-.CP7	3TF6. 44-.CQ7	3TF6. 44-.CS7
Electromagnetic compatibility						
Rated control supply voltage U_s	V AC	110 ... 132	200 ... 240	230 ... 277	380 ... 460	500 ... 600
Overvoltage type acc. to IEC 60801		Burst/Surge				
Degree of severity acc. to IEC 60801						
• Burst		3	4	4	4	4
• Surge		4	4	4	4	4
Overvoltage resistance						
• Burst	kV	2	4	4	4	4
• Surge	kV	6	5	5	6	6

Contactor		Type		3TF68	3TF69
		Size		14	14
Main circuit					
AC capacity					
Utilization category AC-1 Switching resistive loads					
• Rated operational currents I_e	At 40 °C up to 690 V		A	700	910
	At 55 °C up to 690 V		A	630	850
	At 55 °C up to 1000 V		A	450	800
• Rated power for AC loads with p.f. = 0.95 at 55°C	230 V		kW	240	323
	400 V		kW	415	558
	500 V		kW	545	735
	690 V		kW	720	970
	1000 V		kW	780	1385
• Minimum conductor cross-sections for loads with I_e	At 40°C		mm^2	2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 (copper busbars)
	At 55°C		mm^2	2 x 185	$I_e < 800$ A: 2 x 240
Utilization categories AC-2 and AC-3					
• Rated operational currents I_e	Up to 690 V		A	630	820
	1000 V		A	435	580
• Rated power for slipring or squirrel-cage motors at 50 Hz and 60 Hz	At 230 V		kW	200	260
	400 V		kW	347	450
	500 V		kW	434	600
	690 V		kW	600	800
	1000 V		kW	600	800
Thermal load capacity	10 s current		A	5 040	7 000
Power loss per conducting path	At I_e/AC-3		W	45	70
Utilization category AC-4 (for $I_a = 6 \times I_e$)					
• Rated operational current I_e	Up to 690 V		A	610	690
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V		kW	355	400
The following applies to a contact endurance of about 200000 operating cycles:					
• Rated operational currents I_e	Up to 690 V		A	300	360
	1000 V		A	210	250
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V		kW	97	110
	400 V		kW	168	191
	500 V[1]		kW	210	250
	690 V[1]		kW	278	335
	1000 V[1]		A	290	350
Switching frequency					
Switching frequency z in operating cycles/hour					
• Contactors without overload relays	No-load switching frequency AC		1/h	2000	1000
	No-load switching frequency DC		1/h	1000	1000
		AC-1	1/h	700	700
		AC-2	1/h	200	200
		AC-3	1/h	500	500
		AC-4	1/h	150	150
• Contactors with overload relays (mean value)			1/h	15	15

[1] Max. permissible rated operational current I_e/AC-4 = I_e/AC-3 up to 500 V, for reduced contact endurance and reduced switching frequency.

Contactor	Type	3TF68	3TF69
	Size	14	14
Conductor cross-sections			
Main conductors:		Screw terminals	
• Busbar connections			
- Finely stranded with cable lug	mm^2	50 ... 240	50 ... 240
- Stranded with cable lug	mm^2	70 ... 240	50 ... 240
- Solid or stranded	AWG	2/0 ... 500 MCM	2/0 ... 500 MCM
- Connecting bar (max. width)	mm	50	60 ($U_e \leq 690$ V) 50 ($U_e > 690$ V)
• Terminal screw		M10 x 30	M12 x 40
- Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)	20 ... 35 (177 ... 310 lb.in)
• With box terminal[1)]			
- Connectable copper bars			
- Width	mm	15 ... 25	15 ... 38
- Max. thickness	mm	1 x 26 or 2 x 11	1 x 46 or 2 x 18
- Terminal screw		A/F 6 (hexagon socket)	A/F 8 (hexagon socket)
- Tightening torque	Nm	25 ... 40	35 ... 50
	lb.in	221 ... 354	266 ... 443
Auxiliary conductors:			
• Solid	mm^2	2 x (0.5 ... 1)[2)]/2 x (1 ... 2.5)[2)]	
• Finely stranded with end sleeve	mm^2	2 x (0.5 ... 1)[2)]/2 x (0.75 ... 2.5)[2)]	
• Pin-end connector acc. to DIN 46231	mm^2	2 x (1 ... 1.5)	
• Solid or stranded	AWG	2 x (18 ... 12)	
• Tightening torque	Nm	0.8 ... 1.4	
	lb.in	7 ... 12	

1) See "Accessories and Spare Parts", page 2/56.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Contactor	Type	3TF68	3TF69
	Size	14	14
CSA and UL rated data			
Rated insulation voltage	V AC	600	600
Uninterrupted current			
• Open and enclosed	A	630	820
Maximum horsepower ratings (CSA and UL approved values)			
• Rated power for induction motors at 60 Hz			
- At 200 V	hp	231	290
- At 230 V	hp	266	350
- At 460 V	hp	530	700
- At 575 V	hp	664	860
NEMA/EEMAC ratings			
SIZE	hp	6	7
• Uninterrupted current			
- Open	A	600	820
- Enclosed	A	540	810
• Rated power for induction motors at 60 Hz			
- At 200 V	hp	150	--
- At 230 V	hp	200	300
- At 460 V	hp	400	600
- At 575 V	hp	400	600
Overload relays	Type	3RB12 .	
• Setting range	A	200 ... 820	

Overview

3TC4 and 3TC5

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1

The contactors are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

The DC motor ratings given in the tables are applicable to the DC-3 and DC-5 utilization categories with two-pole switching of the load or with the two conducting paths of the contactor connected in series.

One contactor conducting path can switch full power up to 220 V. The ratings for higher voltages are available on request.

3TC7

IEC 60947-4-1, EN 60947-4-1.

The contactors are suitable for use in any climate. They are suitable for switching and controlling DC motors as well as all other DC circuits.

The solenoid excitation is configured for a particularly large operating range. It is between 0.7 or 0.8 to 1.2 x U_s.

3TC74 contactors can be used at up to 750 V/400 A and 50 Hz in AC-1 operation.

Application

The contactors are suitable for switching and controlling DC motors as well as all other DC circuits.

A version with an especially large coil operating range is available for operation in electrically driven vehicles and in switchgears with significant fluctuations in the actuating voltage

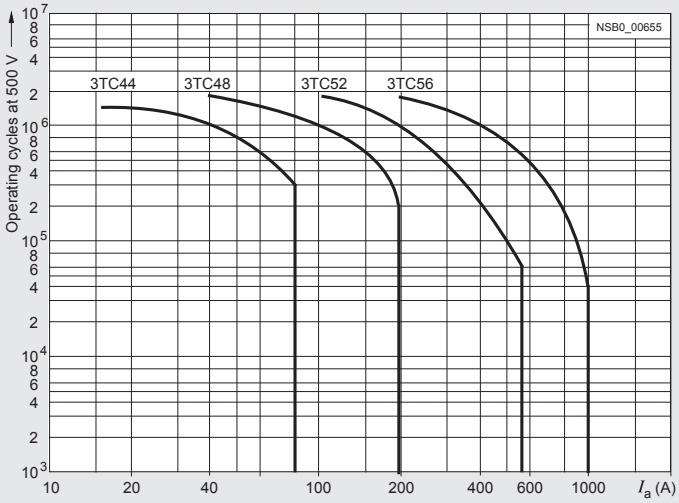
.

Technical specifications

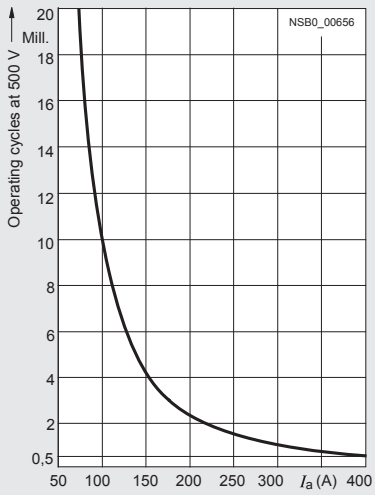
Contactors	Type		3TC4 and 3TC7	3TC5
Rated data of the auxiliary contacts				
Rated insulation voltage U_i (pollution degree 3)		V	690	
Conventional thermal current I_{th} = Rated operational current I_e/AC-12		A	10	10
AC load **Rated operational current I_e/AC-15/AC-14** • For rated operational voltage U_e				
	24 V	A	10	10
	110 V	A	10	10
	125 V	A	10	10
	220 V	A	6	6
	230 V	A	5.6	5.6
	380 V	A	4	4
	400 V	A	3.6	3.6
	500 V	A	2.5	2.5
	660 V	A	2.5	2.5
	690 V	A	--	--
DC load **Rated operational current I_e/DC-12** • For rated operational voltage U_e				
	24 V	A	10	10
	60 V	A	10	10
	110 V	A	3.2	8
	125 V	A	2.5	6
	220 V	A	0.9	2
	440 V	A	0.33	0.6
	600 V	A	0.22	0.4
Rated operational current I_e/DC-13 • For rated operational voltage U_e				
	24 V	A	10	10
	60 V	A	5	5
	110 V	A	1.14	2.4
	125 V	A	0.98	2.1
	220 V	A	0.48	1.1
	440 V	A	0.13	0.32
	600 V	A	0.07	0.21

Contactors	Type	3TC44 ... 3TC56
cULus and cULus rated data of the auxiliary contacts		
Rated voltage, max.	V AC	600
Switching capacity		A 600, P 600

Contactors	Type	3TC44 ... 3TC78
Contact endurance of the main contacts		

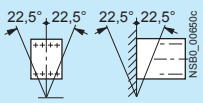


3TC44 to 3TC56 contactors



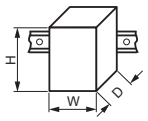
3TC74 and 3TC78 contactors

Legend for the diagrams:
I_a = Breaking current

Contactors	Type Size	3TC44 2	3TC48 4	3TC52 8	3TC56 12
General technical specifications					
Permissible mounting positions The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance	Operating cycles	10 million			
Electrical endurance	Operating cycles	[1]			
Rated insulation voltage U_i (pollution degree 3)	V	800		1000	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	Up to 300		Up to 660	
Mirror contacts[2] A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.		Yes, acc. to IEC 60947-4-1, Appendix F			
Permissible ambient temperature					
• During operation	°C	-25 ... +55			
• During storage	°C	-50 ... +80			
Degree of protection acc. to IEC 60947-1, Appendix C		IP00/open, for AC operation, coil assembly IP40			
Shock resistance	Rectangular pulse *g*/ms	7.5/5 and 3.4/10	10/5 and 5/10	12/5 and 5.5/10	12/5 and 5.6/10
Short-circuit protection					
Main circuit Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE					
• Type of coordination "1"	A	50	160	250	400
• Type of coordination "2"	A	35	63	80	250
Auxiliary circuit					
• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1	A	16			
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current I_k = 400 A acc. to IEC 60947-5-1	A	10			

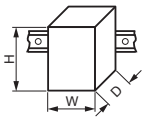
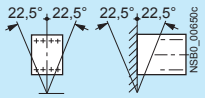
1) See the endurance diagram above.

2) For 3TC44, one NC contact each must be connected in series for the right and left auxiliary switch block respectively.



Type			3TC44	3TC48	3TC52	3TC56
Size			2	4	8	12
Dimensions (W x H x D)						
• DC operation		mm	70 x 85 x 141	100 x 183 x 180	135 x 238 x 232	160 x 279 x 310
• AC operation		mm	70 x 85 x 100	100 x 183 x 154	135 x 238 x 200	160 x 279 x 251
Control circuits						
Coil operating range			0.8 ... 1.1 x U_s			
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)						
• DC operation	- Closing = Closed	W	10	19	30	86
• AC operation, 50 Hz coil	- Closing	VA/p.f.	68/0.86	300/0.5	640/0.48	1780/0.3
	- Closed	VA/p.f.	10/0.29	26/0.24	46/0.23	121/0.22
• AC operation, 60 Hz coil	- Closing	VA/p.f.	95/0.79	365/0.45	730/0.38	2140/0.3
	- Closed	VA/p.f.	12/0.3	35/0.26	56/0.24	140/0.29
• AC operation, 50/60 Hz coil	- Closing at 50 Hz/60 Hz	VA/p.f.	79/73/0.83/0.78	--	--	--
	- Closed at 50 Hz/60 Hz	VA/p.f.	11/9/0.28/0.27	--	--	--
Operating times (for 0.8 ... 1.1 x U_s) Total break time = Opening delay + Arcing time			(The values apply up to and including 20 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)			
• DC operation	- Closing delay	ms	35 ... 190	90 ... 380	120 ... 400	110 ... 400
	- Opening delay[1]	ms	10 ... 25	17 ... 28	22 ... 35	40 ... 110
• AC operation	- Closing delay	ms	10 ... 40	20 ... 50	20 ... 50	20 ... 50
	- Opening delay[1]	ms	5 ... 25	5 ... 30	10 ... 30	10 ... 30
• Arcing time	- DC-1	ms	20			
	- DC-3/DC-5	ms	30			
Main circuit						
Load rating with DC						
Utilization category DC-1, switching resistive loads (L/R ≤ 1 ms)						
• Rated operational currents I_e (at 55 °C)	Up to U_e 750 V	A	32	75	220	400
• Minimum conductor cross-section		mm^2	6	25	95	240
• Rated power at U_e	At 220 V	kW	7	16.5	48	88
	440 V	kW	14	33	97	176
	600 V	kW	19.2	45	132	240
	750 V	kW	24	56	165	300
Utilization category DC-3 and DC-5 Shunt-wound and series-wound motors (L/R ≤ 15 ms)						
• Rated operational currents I_e (at 55 °C)	Up to 220 V	A	32	75	220	400
	440 V	A	29	75	220	400
	600 V	A	21	75	220	400
	750 V	A	7.5	75	170	400
• Rated power at U_e	At 110 V	kW	2.5	6.5	20	35
	220 V	kW	5	13	41	70
	440 V	kW	9	27	82	140
	600 V	kW	9	38	110	200
	750 V	kW	4	45	110	250
Switching frequency						
Switching frequency *z* in operating cycles/hour						
AC/DC operation						
• With resistive load DC-1		h^{-1}	1500	1000		
• For inductive load DC-3/DC-5		h^{-1}	750	600		
Conductor cross-sections (1 or 2 conductors connectable)						
Main conductors:			Screw terminals			
• Solid		mm^2	2 x (2.5 ... 10)	2 x (6 ... 16)	--	--
• Finely stranded with end sleeve		mm^2	2 x (1.5 ... 4)	--	--	--
• Stranded with cable lug		mm^2	2 x 16	2 x 35	2 x 120	2 x 150
• Pin-end connector acc. to DIN 46231		mm^2	2 x (1 ... 6)	--	--	--
• Busbars		mm	--	15 x 2.5	25 x 4	2 x (25 x 3)
• Terminal screw			M5	M6	M10	M10
Auxiliary conductors:						
• Solid		mm^2	2 x (1 ... 2.5)			
• Finely stranded with end sleeve		mm^2	2 x (0.75 ... 1.5)			

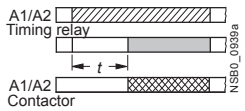
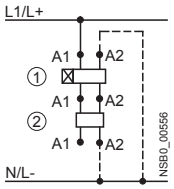
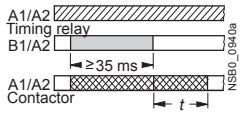
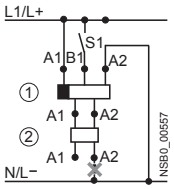
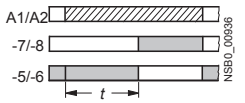
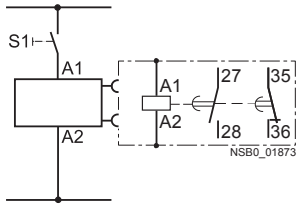
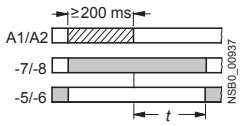
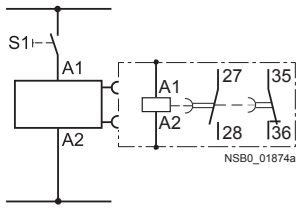
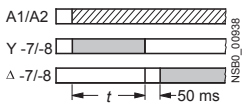
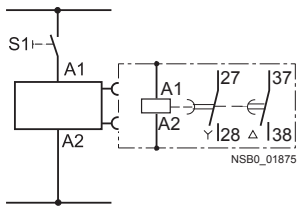
[1] The opening delay times can increase if the contactor coils are damped against voltage peaks. Only 3TC44 contactors are allowed to be fitted with diodes.

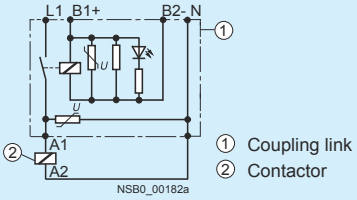
Type				**3TC74**	**3TC78**
Design				**1-pole contactors**	**2-pole contactors**
Dimensions			mm	78 x 352 x 276	160 x 366 x 290
General technical specifications					
Permissible mounting positions The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance		Operating cycles		30 million	
Electrical endurance		Operating cycles		1)	
Rated insulation voltage U_i (pollution degree 3)			V	1500	
Rated impulse withstand voltage U_{imp}			kV	8	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N			V	630	
Permissible ambient temperature			°C	-25 ... +55	
Degree of protection acc. to IEC 60947-1, Appendix C				IP00/open	
Short-circuit protection					
Main circuit Fuse links, operational class gG: LV HRC, type 3NA					
• Type of coordination "1"			A	630	
• Type of coordination "2"			A	500	
Auxiliary circuits					
• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1			A	16	
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current I_k = 400 A acc. to IEC 60947-5-1			A	10	
Control circuits					
Coil operating range					
• DC operation		At U_c = 24 V		0.8 ... 1.2 x U_s	
		At U_c > 24 V		0.7 ... 1.2 x U_s	
• AC operation		At U_c = 24 V		0.7 ... 1.15 x U_s	
		At U_c > 24 V		0.7 ... 1.14 x U_s	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)					
• DC operation	Closing = Closed		W	46	92
• AC operation, 50 Hz	Closing,		VA	80	160
	Closed			0.95	0.95
Operating times (Total break time = Opening delay + Arcing time)				(The values apply up to and including 15 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)	
• AC and DC operation	- Closing delay		ms	60 ... 100	
	- Opening delay		ms	20 ... 35	
• Arcing time at 0.06 ... 4 x I_e			ms	40 ... 70	
Main circuit					
Load rating with DC					
Utilization category DC-1, switching resistive loads ($L/R \leq 1$ ms)					
• Rated operational current I_e/DC-1 (at 55 °C)			A	500	500
• Minimum conductor cross-section			mm^2	2 x 150	2 x 150
• Rated power		At 220 V	kW	110	110
		440 V	kW	220	220
		600 V	kW	300	300
		750 V	kW	375	375
		1200 V	kW	—	600
		1500 V	kW	—	750
• Critical currents, without arc extinction		At 440 V	A	≤ 7	—
		600 V	A	≤ 13	—
		750 V	A	≤ 15	—
		≤ 800 V	A	—	≤ 7
		1200 V	A	—	≤ 13
		1500 V	A	—	≤ 15
Utilization categories DC-3 and DC-5, switching DC motors				2)	
Permissible rated current for regenerative braking	At 110 ... 600 V		A	400	
Switching frequency					
Switching frequency *z* in operating cycles/hour AC/DC operation					
• With resistive load DC-1			h^{-1}	750	1000
• For inductive load DC-3/DC-5			h^{-1}	500	500

1) Endurance see page 2/181..
2) See Selection and ordering data.

Technical specifications

Contactor	Type		3RT19 26-2C	3RT19 26-2D	3RT19 26-2E	3RT19 26-2F	3RT19 26-2G
			Solid-state timing relay blocks with semiconductor output		Solid-state time-delay auxiliary switch blocks		
General data							
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to EN 60664-1		V AC	250				
Permissible ambient temperature							
• During operation		°C	-25 ... +60				
• During storage		°C	-40 ... +80				
Degree of protection acc. to EN 60947-1, Appendix C • Cover • Terminals			 IP40 IP20				
Shock resistance Half-sine acc. to IEC 60068-2-27		g/ms	15/11				
Vibration resistance according to IEC 60068-2-6		Hz/mm	10 ... 55/0.35				
EMC tests	Basic specification		IEC 61000-6-4				
Conductor connections							
• Solid		mm^2	2 x (0.5 ... 1.5), 2 x (0.75 ... 4)				
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 2.5)				
• AWG cables, solid or stranded		AWG	2 x (18 ... 14)				
• Terminal screws			M3				
• Tightening torque		Nm lb.in	0.8 ... 1.2 7 ... 10.3				
Permissible mounting positions			Any				
Control							
Operating range of excitation			0.8 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency		0.85 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency		
Rated power		W	1		2		
• Power consumption at 230 V AC, 50 Hz		VA	1		4		
Overvoltage protection			Varistor integrated in timing relay		--		
Recovery time		ms	50		150		
Minimum ON period		ms	35		200 (with OFF-delay)		
Setting accuracy With reference to upper limit of scale	Typ.	%	±15				
Repeat accuracy	Max.	%	±1				
Load side							
Rated operational currents I_e							
• Load current		A	0.3		--		
• AC-15, 230 V, 50 Hz		A	--		3		
• DC-13, 24 V		A	--		1		
• DC-13, 110 V		A	--		0.2		
• DC-13, 230 V		A	--		0.1		
Short-time loading capacity	Up to 10 ms	A	10		--		
DIAZED protection gG operational class		A	--		4		
Residual current	Max.	mA	5		--		
Voltage drop With conducting output	Max.	VA	3.5		--		
Mechanical endurance		Operating cycles	100×10^6		10×10^6		
Switching frequency for load							
• With I_e at 230 V AC		h^{-1}	200		2500		
• With 3RT20 16 contactor at 230 V AC		h^{-1}	2500		5000		

Function	Function chart
	▨ Timing relay energized ▩ Contact closed □ Contact open
Solid-state timing relay blocks	**1 NO contact (semiconductor output)**
ON-delay, two-wire design (varistor integrated)	3RT19 26-2C   A2 can be connected to N(L-) using either the contactor or the timing relay. - - - - To be connected optionally ① Timing relay block ② Contactor
OFF-delay with auxiliary voltage (varistor integrated)	3RT19 26-2D   A2 must only be connected to N(L--) from the timing relay. ✕ Do not connect ① Timing relay block ② Contactor
Solid-state time-delay auxiliary switch blocks	**1 NO + 1 NC**
ON-delay	3RT19 26-2E  
OFF-delay without auxiliary voltage	3RT19 26-2F  
Solid-state time-delay auxiliary switch blocks	**2 NO**
Wye-delta function: 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)	3RT19 26-2G  

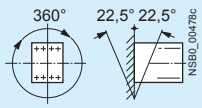
Contactor	Type		3RH19 24, 3TX7 090 Coupling links for mounting on contactors acc. to IEC 60947/EN 60947
General data			
Rated insulation voltage U_i (pollution degree 3)		V	300
Protective separation between coil and contacts acc. to IEC 60947-1, Appendix N		V AC	Up to 300
Permissible ambient temperature			
• During operation		°C	-25 ... +60
• During storage		°C	-40 ... +80
Degree of protection acc. to IEC 60947-1, Appendix C			
• Connections			IP20
• Enclosure			IP40
Circuit diagram			
Conductor cross-sections			
• Solid		mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)
Terminal screws			M3
Control side			
Rated control supply voltage U_s		V DC	24
Operating range		V DC	17 ... 30
Power consumption at U_s		W	0.5
Nominal current input		mA	20
Release voltage		V	≥ 4
Function display			Yellow LED
Protection circuit			Varistor
Load side			
Mechanical endurance	Operating cycles		20×10^6
Electrical endurance at I_e	Operating cycles		1×10^5
Switching frequency	Operating cycles	h^{-1}	5000
Make-time		ms	Approx. 7
Break-time		ms	Approx. 4
Bounce time		ms	Approx. 2
Contact material			AgSnO
Switching voltage	AC/DC	V	24 ... 250
Permissible residual current of the electronics (with 0 signal)		mA	2.5

Technical specifications

Contactor relays	Type	**3RH2**
	Size	**S00**

Permissible mounting positions

The contactor relays are designed for operation on a vertical mounting surface.



Upright mounting position

Special version required

(3RH21 22-2K.40 coupling relays and contactor relays with extended operating range on request)

Positively-driven operation of contacts in contactor relays

3RH2:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the front-mounted auxiliary switch block (removable) acc. to:
- ZH 1/457
- IEC 60947-5-1, Appendix L

3RH22:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (permanently mounted) acc. to:
- ZH 1/457
- IEC 60947-5-1, Appendix L

Note:

3RH29 11-.NF. solid-state compatible auxiliary switch blocks have no positively-driven contacts.

Explanations:
There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

ZH1/457
Safety Rules for Controls on Power-Operated Metalworking Presses.

IEC 60947-5-1, Appendix L
Low-Voltage Controlgear, Controls and Contact Blocks. Special requirements for positively-driven contacts

Contact reliability

Contact reliability at 17 V, 1 mA acc. to IEC 60947-5-4

Frequency of contact faults $<10^{-8}$ i.e. < 1 fault per 100 million operating cycles

Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary, e.g. in the form of RC elements and free-wheel diodes.

The characteristic curves apply to:

- 3RH21/3RH22 contactor relays
- 3RH24 latched contactor relays
- 3RH29 11 auxiliary switch blocks[1)]
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00

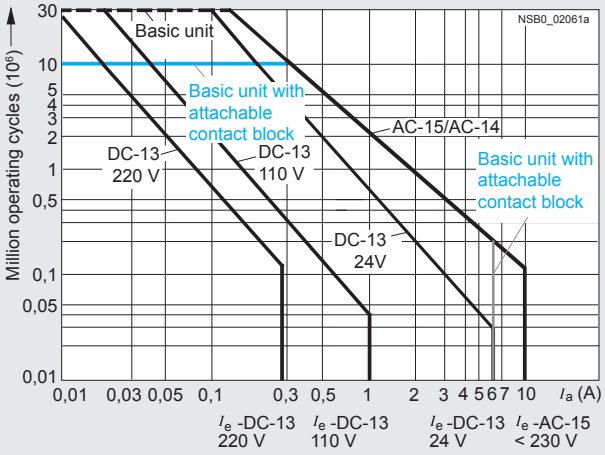
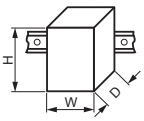
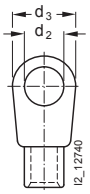


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

1) I_e = 6 A for AC-15/AC-14.

Type			**3RH21**	**3RH22**	**3RH24**
Size			**S00**	**S00**	**S00**
Dimensions (W x H x D) with screw terminals		mm	45 x 57.5 x 73	--	90 x 57.5 x 73
• With mounted auxiliary switch block		mm	45 x 57.5 x 116	45 x 57.5 x 116	--
General technical specifications					
Mechanical endurance					
• Basic units		Operating cycles	30 million		5 million
• Basic unit with snap-on auxiliary switch block		Operating cycles	10 million		
• Solid-state compatible auxiliary switch block		Operating cycles	5 million		
Rated insulation voltage U_i (pollution degree 3)		V	690		
Rated impulse withstand voltage U_{imp}		kV	6		
Protective separation between the coil and the contacts in the basic unit acc. to IEC 60947-1, Appendix N		V	400		
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C			IP20, coil assembly IP40		
Touch protection acc. to EN 50274			Finger-safe		
Shock resistance					
• Rectangular pulse	- AC operation	*g*/ms	7.3/5 and 4.7/10		
	- DC operation	*g*/ms	>10/5 and >5/10		
• Sine pulse	- AC operation	*g*/ms	11.4/5 and 7.3/10		
	- DC operation	*g*/ms	>15/5 and >8/10		
Short-circuit protection					
• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1		A	10		
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current I_k = 400 A acc. to IEC 60947-5-1		A	6		
Conductor cross-sections					
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			**Screw terminals**		
• Solid		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947; max. 2 x (0.5 ... 4)		
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]		
• AWG cables, solid or stranded		AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]		
• Terminal screw			M3 (for standard screwdriver size 2 or Pozidriv 2)		
- Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			**Spring-type terminals**		
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5		
• Solid		mm^2	2 x (0.5 ... 4)		
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded		AWG	2 x (20 ... 12)		
Auxiliary conductors for front and laterally mounted auxiliary switches					
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5		
• Solid		mm^2	2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)		
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 2.5)		
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)		
Auxiliary conductor and coil terminals			**Ring terminal lug connection**		
• Terminal screw		mm	M3, Pozidriv size 2		
• Operating devices		Nm	Ø 5 ... 6		
• Tightening torque		mm	0.8 ... 1.2		
• Usable ring terminal lugs		mm	d_2 = min. 3.2		
- DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve		mm	d_3 = max. 7.5		

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Note:

Max. external diameter of the cable insulation: 3.6 mm.

Tool for opening the spring-type terminals see Accessories, page 2/81.

An insulation stop must be used for conductor cross-sections ≤1 mm^2, see Accessories, page 2/81.

Contactor relays	Type		3RH2.
	Size		S00
Control circuits			
Coil operating range			
• AC operation	At 50 Hz		0.8 ... 1.1 x U_s
	At 60 Hz		0.85 ... 1.1 x U_s
• DC operation	At +50 °C		0.8 ... 1.1 x U_s
	At +60 °C		0.85 ... 1.1 x U_s
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)			
• AC operation, 50 Hz			
- Closing		VA/p.f.	37/0.8
- Closed		VA/p.f.	5.7/0.25
• AC operation, 60 Hz			
- Closing		VA/p.f.	33/0.75
- Closed		VA/p.f.	4.4/0.25
• DC operation (closing = closed)		W	4.0
Permissible residual current of the electronics (with 0 signal)			
• For AC operation[1]			< 4 mA x (230 V/U_s)
• For DC operation			< 10 mA x (24 V/U_s)
Operating times[2]			
Total break time = OFF-delay + Arcing time			
Values apply with coil in cold state and at operating temperature for operating range			
AC operation			
• Closing			
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s	ms	8 ... 33
	With 1.0 x U_s	ms	9 ... 22
	3RH24 minimum operating time	ms	≥35
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s	ms	6 ... 25
	With 1.0 x U_s	ms	6.5 ... 19
• Opening			
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s	ms	4 ... 15
	With 1.0 x U_s	ms	4.5 ... 15
	3RH24 minimum operating time	ms	≥30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s	ms	5 ... 15
	With 1.0 x U_s	ms	5 ... 15
DC operation			
• Closing			
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s	ms	30 ... 100
	With 1.0 x U_s	ms	35 ... 50
	3RH24 minimum operating time	ms	≥100
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s	ms	25 ... 90
	With 1.0 x U_s	ms	30 ... 45
• Opening			
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s	ms	7 ... 13
	With 1.0 x U_s	ms	7 ... 12
	3RH24 minimum operating time	ms	≥30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s	ms	13 ... 19
	With 1.0 x U_s	ms	13 ... 18
• Arcing time		ms	10 ... 15
Dependence of the switching frequency z' on the operational current I' and operational voltage U':			
$z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			

1) The 3RT29 16-1GA00 additional load module is recommended for higher residual currents (see page 2/76).

2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms).

Contactor relays	Type		3RH2.
	Size		S00
Load side			
AC capacity			
Rated operational currents I_e			
AC-12		A	10
AC-15/AC-14 for rated operational voltage U_s			
	Up to 230 V	A	6
	400 V	A	3
	500 V	A	2
	690 V	A	1
Load rating with DC			
Rated operational currents I_e			
DC-12 for rated operational voltage U_s			
• 1 conducting path	24 V	A	6
	60 V	A	6
	110 V	A	3
	220 V	A	1
	440 V	A	0.3
	600 V	A	0.15
• 2 conducting paths in series	24 V	A	10
	60 V	A	10
	110 V	A	4
	220 V	A	2
	440 V	A	1.3
	600 V	A	0.65
• 3 conducting paths in series	24 V	A	10
	60 V	A	10
	110 V	A	10
	220 V	A	3.6
	440 V	A	2.5
	600 V	A	1.8
DC-13 for rated operational voltage U_s			
• 1 conducting path	24 V	A	6
	60 V	A	2
	110 V	A	1
	220 V	A	0.3
	440 V	A	0.14
	600 V	A	0.1
• 2 conducting paths in series	24 V	A	10
	60 V	A	3.5
	110 V	A	1.3
	220 V	A	0.9
	440 V	A	0.2
	600 V	A	0.1
• 3 conducting paths in series	24 V	A	10
	60 V	A	4.7
	110 V	A	3
	220 V	A	1.2
	440 V	A	0.5
	600 V	A	0.26
Switching frequency			
Switching frequency *z* in operating cycles/hour			
• For rated operation	AC-12/DC-12	h^{-1}	1000
For utilization category	AC-15/AC-14	h^{-1}	1000
	DC-13	h^{-1}	1000
• No-load switching frequency		h^{-1}	10000
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			
cULus and cULus rated data			
Basic units and auxiliary switch blocks			
• Rated control supply voltage		V AC	max. 600
• Rated voltage		V AC	600
• Switching capacity			A 600, Q 600
• Uninterrupted current at 240 V AC		A	10

Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RH21 contactor relays (see page 5/6).

Contactor type		3RH21 ..-.HB40	3RH21 ..-.JB40	3RH21 ..-.KB40
Size		S00	S00	S00
Control circuits				
Coil operating range		0.7 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed				
• At U_s = 17 V	W	1.4		
• At U_s = 24 V	W	2.8		
• At U_s = 30 V	W	4.4		
Permissible residual current of the electronics for 0 signal		< 10 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		No overvoltage damping 	With diode 	With suppressor diode 
Operating times				
• **Closing** at 17 V				
- ON-delay NO	ms	40 ... 130		
- OFF-delay NC	ms	30 ... 80		
• At 24 V				
- ON-delay NO	ms	35 ... 60		
- OFF-delay NC	ms	25 ... 40		
• At 30 V				
- ON-delay NO	ms	25 ... 50		
- OFF-delay NC	ms	15 ... 30		
• **Opening** at 17 ... 30 V				
- OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20
- ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30
Upright mounting position		Request required		

Contactor type		3RH21 ..-.MB40-0KT0	3RH21 ..-.VB40	3RH21 ..-.WB40
Size		S00	S00	S00
Control circuits				
Coil operating range		0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed at U_s = 24 V	W	1.6		
Permissible residual current of the electronics for 0 signal		< 8 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		Diode, varistor or RC element, attachable 	Built-in diode 	Built-in suppressor diode 
Control circuits				
Operating times				
• Closing at 20.5 V				
- ON-delay NO	ms	30 ... 120		
- OFF-delay NC	ms	20 ... 110		
• At 24 V				
- ON-delay NO	ms	25 ... 90		
- OFF-delay NC	ms	15 ... 80		
• At 44 V				
- ON-delay NO	ms	15 ... 60		
- OFF-delay NC	ms	10 ... 50		
• Closing at 17 ... 30 V				
- OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20
- ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30
Upright mounting position		Request required		

Terminal designations and identification numbers for auxiliary contacts

Terminal designations

The terminal designations are 2-digit, e.g. 13, 14, 21, 22:

- Tens digit: Sequence digit
  - Related terminals have the same sequence digit
- Units digit: Function digit
  - 1-2 for normally closed contacts (NC)
  - 3-4 for normally open contacts (NO)

Identification numbers

The identification number indicates the number and type of the auxiliary contacts, e.g. 40, 31, 22, 13:

- 1st digit: number of normally open contacts (NO)
- 2nd digit: number of normally closed contacts (NC)

Examples:

- 31 = 3 NO + 1 NC
- 40 = 4 NO

Selection guide for mountable auxiliary switch blocks for power contactors and contactor relays

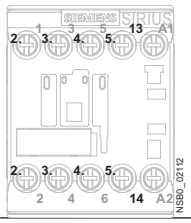
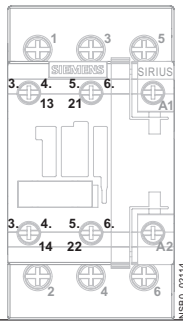
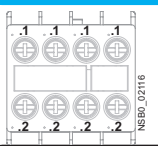
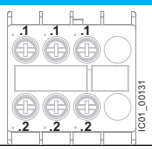
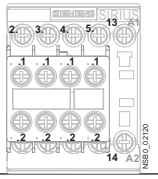
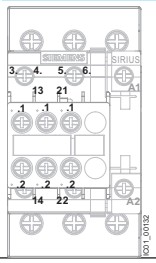
The auxiliary switch blocks of the 3RH29 series for mounting on the front and side can be used for power contactors as well as for contactor relays.

The possible combinations of basic unit and mounted auxiliary switch block can be found in the tables below.

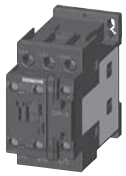
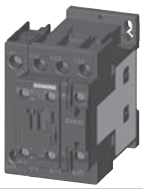
Where the columns and lines intersect (blue and green in the example) you will find the identification number for the combination of basic unit (column) and auxiliary switch block (line).

Auxiliary contacts NO	Auxiliary contacts NC	Version	3-pole contactors 3RT20 1 S00	3RT20 1 S00	3RT20 2 S0	Order No.
			10	01	11	
			2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	
			According to EN 50012[1]			
Auxiliary switches without NO contact						
--	1	.1 .2	11	02	12	**3RH29 11-.HA01**
--	2	.1 .2 .1 .2	12	03	13	**3RH29 11-.HA02**
--	3	.1 .2 .1 .2 .1 .2	13	04	14	**3RH29 11-.HA03**
--	4	.1 .2 .1 .2 .1 .2 .1 .2	14	--		**3RH29 11-.FA04**
Auxiliary switch with 1 NO contact						
1	--	.3 .4	20	11	21	**3RH29 11-.HA10**
1	1	.1 .2 .3 .4	21	12	22	**3RH29 11-.HA11**

1) Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

	Example 1	Example 2
Type	**3RT20 motor contactor, S00 with 1 NO**	**3RT20 motor contactor, S0 with 1 NO + 1 NC**
		
Sequence digit	2. 3. 4. 5.	3. 4. 5. 6.
Type	**Auxiliary switch with 4 NC, 3RH29 11-.FA04**	**Auxiliary switch with 3 NC, 3RH29 11-.HA03**
		
Function digit	.1 .2 .1 .2 .1 .2 .1 .2	.1 .2 .1 .2 .1 .2
Type	**3RT20 motor contactor, S00 with auxiliary switch block**	**3RT20 motor contactor, S0 with auxiliary switch block**
		
Terminal design.	13 21 31 41 51 14 22 32 42 52	13 21 31 41 51 14 22 32 42 52
Type	**Ident. No. 14**	**Ident. No. 14**

Additional auxiliary switch blocks


	3-pole contactors			4-pole contactors				Contactor relays			
Auxiliary contacts	S00		S0	S00		S0/S2		S00			
Version	3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24	3RH21, 3RH24	3RH21, 3RH24	
NO NC	10	01	11	--	--	11	11	40E	31E	22E	
	13 14	21 22	13 21 14 22			13 21 14 22	13 21 14 22	13 23 33 43 14 24 34 44	13 21 33 43 14 22 34 44	13 21 31 43 14 22 32 44	
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8	
Front auxiliary switches	According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			Order No.
Without NO contact											
-- 1	11	02	12	01	01	12	12	41X	32X	23X	**3RH29 11-.HA01**
-- 2	12	03	13	02	02	13	--	42E	33X	24	**3RH29 11-.HA02**
-- 3	13	04	14	03	--	--	--	43	34	--	**3RH29 11-.HA03**
-- 4	14	--	--	--	--	--	--	44E	--	--	**3RH29 11-.FA04**
With 1 NO contact											
1 --	20	11	21	10	10	21	21	50E	41E	32E	**3RH29 11-.HA10**
1 1	21	12	22	11	11	22	22	51X	42X	33X	**3RH29 11-.HA11**
1 2	22	13	23	12	12	23	--	52	43	34	**3RH29 11-.HA12**
1 3	23	14	24	13	--	--	--	53X	44X	--	**3RH29 11-.HA13**
With 2 NO contacts											
2 --	30	21	31	20	20	31	31	60E	51X	42X	**3RH29 11-.HA20**
2 1	31	22	32	21	21	32	32	61	52	43	**3RH29 11-.HA21**
2 2	32	23	33	22	22	33	--	62X	53	44X	**3RH29 11-.HA22**
2 2	32	23	33	22	22	33	--	62X	53	44X	**3RH29 11-.FA22**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

Auxiliary contacts NO	Auxiliary contacts NC	3-pole contactors S00 3RT20 1 10	3-pole contactors 3RT20 1 01	3-pole contactors S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	4-pole contactors 3RT25 1 --	4-pole contactors S0/S2 3RT23 11	4-pole contactors 3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	Contactor relays 31E	Contactor relays 22E	Order No.
		2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8	
		According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			
Front auxiliary switches with 3 NO contacts												
3	--	40	31	41	30	30	41	41	70	61	52	**3RH29 11-.HA30**
3	1	41	32	42	31	31	42	42	71X	62X	53X	**3RH29 11-.HA31**
Front auxiliary switches with 4 NO contacts												
4	--	50	41	51	40	40	51	51	80E	71X	62X	**3RH29 11-.FA40**
		Acc. to EN 50005			Acc. to EN 50005				Acc. to EN 50005			
Front auxiliary switches with make-before-break												
--	1	21	12	22	11	11	22	22	51	42	33	**3RH29 11-.FB11**
--	2	32	23	33	22	22	33	--	62	53	44	**3RH29 11-.FB22**
--	3	32	23	33	22	22	33	--	62	53	44	**3RH29 11-.FC22**
Front auxiliary switches with complete inscription[2]												
1	--	20	11	21	10	10	21	21	50	41	32	**3RH29 11-1AA10**
1	--	20	11	21	10	10	21	21	50	41	32	**3RH29 11-1BA10**
--	1	11	02	12	01	01	12	12	41	32	23	**3RH29 11-1AA01**
--	1	11	02	12	01	01	12	12	41	32	23	**3RH29 11-1BA01**
1	1	21	12	22	11	11	22	22	51	42	33	**3RH29 11-1LA11**
1	1	21	12	22	11	11	22	22	51	42	33	**3RH29 11-1MA11**
2	--	30	21	31	20	20	31	31	60	51	42	**3RH29 11-1LA20**
2	--	30	21	31	20	20	31	31	60	51	42	**3RH29 11-1MA20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

[2] Terminals from the top or bottom.

Additional auxillary switch blocks

Auxiliary contacts Version NO	NC		3-pole contactors S00 3RT20 1 10	3-pole contactors 3RT20 1 01	3-pole contactors S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	4-pole contactors 3RT25 1 --	4-pole contactors S0/S2 3RT23 11	4-pole contactors 3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	Contactor relays 31E	Contactor relays 22E	Order No.
			2. 3. 4. 5. Acc. to EN 50005	5. 6. 7. 8. Acc. to EN 50005	3. 4. 5. 6. Acc. to EN 50005	1. 2. 3. 4. Acc. to EN 50005	1. 2. 3. 4. Acc. to EN 50005	3. 4. 5. 6. Acc. to EN 50005	3. 4. 5. 6. Acc. to EN 50005	5. 6. 7. 8. According to EN 50011[1]	5. 6. 7. 8. According to EN 50011[1]	5. 6. 7. 8. According to EN 50011[1]	
Front auxiliary switches with complete inscription (for contactor relays)													
4	--	53 63 73 83 / 54 64 74 84	--	--	--	--	--	--	--	80E	--	--	**3RH29 11-.GA40**
3	1	53 61 73 83 / 54 62 74 84	--	--	--	--	--	--	--	71E	--	--	**3RH29 11-.GA31**
2	2	53 61 71 83 / 54 62 72 84	--	--	--	--	--	--	--	62E	--	--	**3RH29 11-.GA22**
1	3	53 61 71 81 / 54 62 72 82	--	--	--	--	--	--	--	53E	--	--	**3RH29 11-.GA13**
--	4	51 61 71 81 / 52 62 72 82	--	--	--	--	--	--	--	44E	--	--	**3RH29 11-.GA04**
Front auxiliary switches with complete inscription, special version													
4	--	53 63 73 83 / 54 64 74 84	50	41	51	40	40	51	51	80E	71X	62X	**3RH29 11-.XA40 -0MA0**
3	1	53 61 73 83 / 54 62 74 84	41	32	42	31	31	42	42	71E	62X	53	**3RH29 11-.XA31 -0MA0**
2	2	53 61 71 83 / 54 62 72 84	32	23	33	22	22	33	--	62E	53	44X	**3RH29 11-.XA22 -0MA0**
--	4	51 61 71 81 / 52 62 72 82	14	--	--	--	--	--	--	44E	--	--	**3RH29 11-.XA04 -0MA0**
Front auxiliary switches, Solid-state compatible													
--	2	.1 .1 / .2 .2	12	03	13	02	02	13	--	42	33	24	**3RH29 11-.NF02**
1	1	.3 .1 / .4 .2	21	12	22	11	11	22	22	51	42	33	**3RH29 11-.NF11**
2	--	.3 .3 / .4 .4	30	21	31	20	20	31	31	60	51	42	**3RH29 11-.NF20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

Auxiliary contacts Version NO	NC	Left	Right	3-pole contactors S00 3RT20 1 10	S00 3RT20 1 01	S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	S00 3RT25 1 --	S0/S2 3RT23 11	S0/S2 3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	31E	22E	Order No.
				2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8	
				According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			
Lateral auxiliary switches for size S00														
--	2		21 31 / 22 32	12	--	--	02	02	--	--	--	--	--	**3RH29 11-.DA02**
--	2	41 51 / 42 52	21 31 / 22 32	14	--	--	--	--	--	--	--	--	--	**3RH29 11-.DA02**
1	1		21 33 / 22 34	21	--	--	11	11	--	--	--	--	--	**3RH29 11-.DA11**
1	1	41 53 / 42 54	21 33 / 22 34	32	--	--	22	22	--	--	--	--	--	**3RH29 11-.DA11**
2	--		23 33 / 24 34	30	--	--	20	20	--	--	--	--	--	**3RH29 11-.DA20**
2	--	43 53 / 44 54	23 33 / 24 34	50	--	--	40	40	--	--	--	--	--	**3RH29 11-.DA20**
2 1	-- 1	43 53 / 44 54	21 33 / 22 34	41	--	--	31	31	--	--	--	--	--	**3RH29 11-.DA20 + 3RH29 11-.DA11**
2 --	-- 2	43 53 / 44 54	21 31 / 22 32	32	--	--	22	22	--	--	--	--	--	**3RH29 11-.DA20 + 3RH29 11-.DA02**
1 --	1 2	41 53 / 42 54	21 31 / 22 32	23	--	--	13	--	--	--	--	--	--	**3RH29 11-.DA11 + 3RH29 11-.DA02**
Lateral auxiliary switches for size S0														
--	2		31 41 / 32 42	12	03	13	02	02	13	--	--	--	--	**3RH29 21-.DA02**
--	2	51 61 / 52 62	31 41 / 32 42	14	--	--	--	--	--	--	--	--	--	**3RH29 21-.DA02**
1	1		31 43 / 32 44	21	12	22	11	11	22	22	--	--	--	**3RH29 21-.DA11**
1	1	51 63 / 52 64	31 43 / 32 44	32	23	33	22	22	33	--	--	--	--	**3RH29 21-.DA11**
2	--		33 43 / 34 44	30	21	31	20	20	31	31	--	--	--	**3RH29 21-.DA20**
2	--	53 63 / 54 64	33 43 / 34 44	50	41	51	40	40	51	51	--	--	--	**3RH29 21-.DA20**

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxillary switch blocks

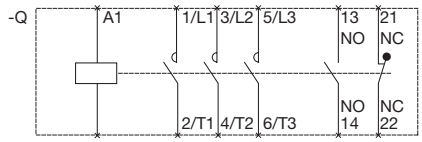
Auxiliary contacts Version NO	NC	Left	Right	3-pole contactors S00 3RT20 1 10	3-pole contactors S00 3RT20 1 01	3-pole contactors S0 3RT20 2 11	4-pole contactors S00 3RT23 1 --	4-pole contactors 3RT25 1 --	4-pole contactors S0/S2 3RT23 11	4-pole contactors 3RT25 11	Contactor relays S00 3RH21, 3RH24 40E	Contactor relays 3RH21, 3RH24 31E	Contactor relays 3RH21, 3RH24 22E	Order No.
				2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8	
				According to EN 50012[1]			According to EN 50012[1]				According to EN 50011[1]			
Lateral auxiliary switches for size S0, S00														
2	--	53 63	31 43	41	32	42	31	31	42	42	--	--	--	**3RH29 21-.DA20 + 3RH29 21-.DA11**
1	1	54 64	32 44											
2	--	53 63	31 41	32	23	33	22	22	33	--	--	--	--	**3RH29 21-.DA20 + 3RH29 21-.DA02**
--	2	54 64	32 42											
1	1	51 63	31 41	23	14	24	13	--	--	--	--	--	--	**3RH29 21-.DA11 + 3RH29 21-.DA02**
--	2	52 64	32 42											
Lateral auxiliary switches for contactor relays														
--	2	51 61		--	--	--	--	--	--	--	42Z	33X	24	**3RH29 21-.DA02**
		52 62												
1	1	51 63		--	--	--	--	--	--	--	51X	42X	33X	**3RH29 21-.DA11**
		52 64												
2	--	53 63		--	--	--	--	--	--	--	60Z	51X	42X	**3RH29 21-.DA20**
		54 64												
Lateral auxiliary switches, Solid-state compatible for size S00														
1	1		23 31	21	--	--	11	11	--	--	--	--	--	**3RH29 11-2DE11**
			24 32											
1	1	41 53	23 31	32	--	--	22	22	--	--	--	--	--	**3RH29 11-2DE11**
		42 54	24 32											
Lateral auxiliary switches, Solid-state compatible for size S0, S00														
1	1		33 41	21	12	22	11	11	22	22	--	--	--	**3RH29 21-2DE11**
			34 42											
1	1	51 63	33 41	32	23	33	22	22	33	--	--	--	--	**3RH29 21-2DE11**
		52 64	34 42											
Lateral auxiliary switches, Solid-state compatible for contactor relays														
1	1	51 63		--	--	--	--	--	--	--	51X	42X	33X	**3RH29 21-.DE11**
		52 64												

[1] Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Internal circuit diagrams (applicable to screw, spring and ring lug connection)

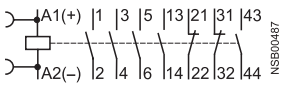
Sizes S3 to S12
Terminal designations according to EN 50 012

3RT10 4 to 3RT10 7, 3RT12, 3RT14 contactors



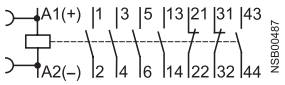
3RT10 4 to 3RT10 7, 3RT14 contactors
With 3RH19 21-. HA22 4-pole auxiliary contact block, mountable on the front

2 NO + 2 NC
Ident. no. 22E



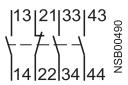
3RT1. 5, 3RT1. 6, 3RT1. 7 contactors (sizes S6, S10, S12)
With 3RH19 21-1DA11 2-pole auxiliary switch blocks, laterally mountable

2 NO + 2 NC

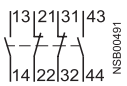


3RH19 21-. HA../-.XA..4-pole auxiliary switch blocks, for snapping onto the front [2]

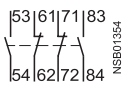
3 NO + 1 NC
Ident. no. 31



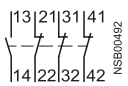
2 NO + 2 NC
22



2 NO + 2 NC
22



1 NO + 3 NC
13



3RH19 21-. DA11, 3RH19 21-2DE11 first laterally mountable auxiliary switch block (solid-state compatible)

1 NO + 1 NC
left

1 NO + 1 NC
right

3RH19 21-. JA11, 3RH19 21-2JE11 second laterally mountable auxiliary switch block (solid-state compatible)
(only for sizes S3 to S12)

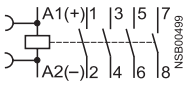
1 NO + 1 NC
left

1 NO + 1 NC
right

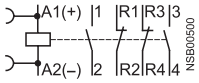
Contactors with 4 main contacts, sizes S3
Terminal designations acc. to EN 50 005

3RT13/23 and 3RT15/25 contactors

4 NO



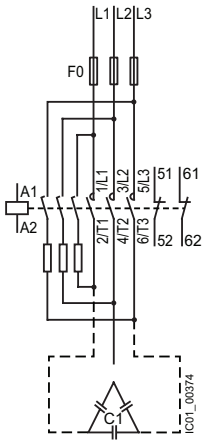
2 NO + 2 NC



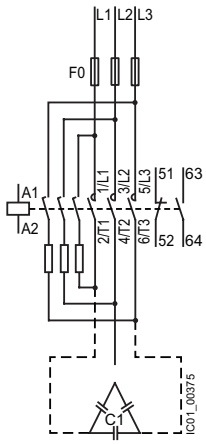
(3RH19 21 auxiliary switch blocks acc. to EN 50 005 can be snapped on)

3RT26 capacitor contactors

Size S00



Sizes S0 and S2



Surge suppressor (plug-in direction coded; exception: marked +/– for 3RT19 16-1T... diode assembly) **for sizes S2 to S3**

Diode

Diode assembly

Varistor

RC element

Diode with LED

Varistor with LED

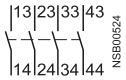
1) 3RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.
3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.
2) Not for 3RT12. vacuum contactors

Internal circuit diagrams (applicable to screw connection and Spring-type terminal connection)

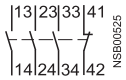
Accessories for size S6[1] to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-.F..., 4-pole,
for snapping onto the front [1]

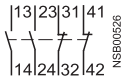
4 NO
Ident. no. 40



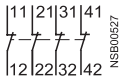
3 NO + 1 NC
31



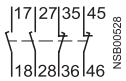
2 NO + 2 NC
22



4 NC
04



2 NO + 2 NC
22 U



make-before-break

3RH19 21-.CA.. auxiliary switch blocks, single-pole,
for snapping onto the front [2]

1 NO

1 NC

(terminal designations according to EN 50 005 or EN 50 012)

3RH19 21-1CD.. auxiliary switch blocks, single-pole,
with make-before-break contacts, for snapping onto the front [1]

1 NO

1 NC

Accessories for size S0 to S12 contactors
Terminal designations acc. to EN 50 005

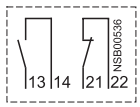
3RH19 21-1LA.. and 3RH19 21-1MA.. auxiliary switch block, 2-pole,
for snapping onto the front [1]
cable entry from above or below

2 NO

1 NO + 1 NC

2 NC

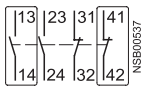
Internal wiring



Example: 1 NO + 1 NC,
cable entry from below

3RH19 21-.FE22 solid-state compatible auxiliary switch block, 4-pole,
for snapping onto the front [1]

2 NO + 2 NC
Ident. no. 22



3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (left)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (right)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (left)
(only for sizes S3 to S12)

2 NO

1 NO + 1 NC

2 NC

3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (right)
(only for sizes S3 to S12)

2 NO

1 NO + 1 NC

2 NC

1) RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.
3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

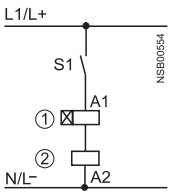
2) Not for 3RT12. vacuum contactors

Circuit diagrams

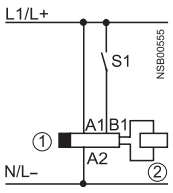
Accessories for size S3 contactors and control relays

Solid-state time-delay blocks
(see configuring aid on page 2/38)

3RT19 16-2C...
ON-delay
Size S00

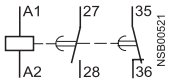


3RT19 16-2D...
OFF-delay (with auxiliary voltage)
Size S00

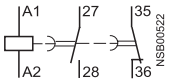


Sizes S2 to S12
3RT19 16-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

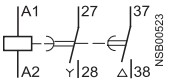
1 NO + 1 NC
ON-delay



1 NO + 1 NC
OFF-delay

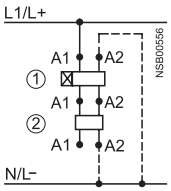


2 NO
WYE-delta function



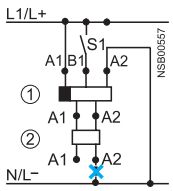
(Integrated varistors not shown)

3RT19 26-2C...
ON-delay
Sizes S0 to S3



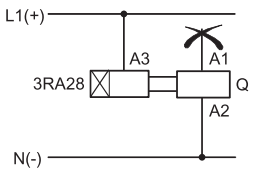
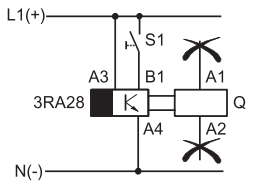
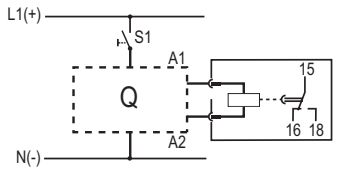
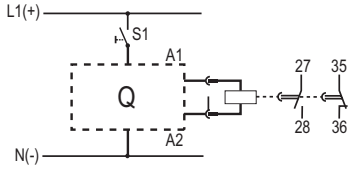
A2 can be connected to N(L–) via either the contactor or the time-delay relay.
- - - optional connection

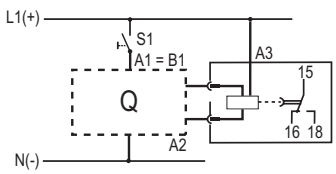
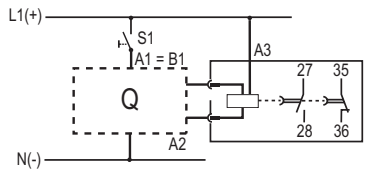
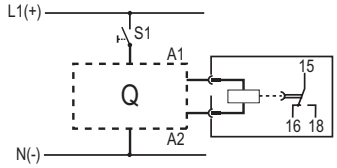
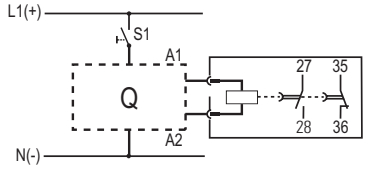
3RT19 26-2D...
OFF-delay (with auxiliary voltage)
Sizes S0 to S3



A2 can only be connected to N(L–) via the time-delay relay.
x don't connect

① Time-delay block
② Contactor

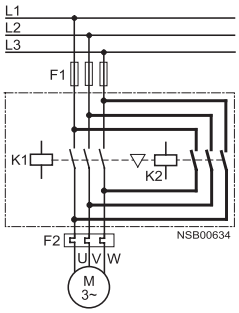
Designation	Circuit diagram
3RA2811-.CW10 ON-delay	
3RA2812-.DW10 OFF-delay with auxillary voltage	
3RA2813-.AW10 ON-delay, 1 CO contact	
3RA2813-.FW10 ON-delay, 1 NC contact/ 1 NO contact	

Designation	Circuit diagram
3RA2814-.AW10 OFF-delay, 1 CO contact	
3RA2814-.FW10 OFF-delay with auxillary voltage, 1 NC contact/ 1 CO contact	
3RA2815-.AW10 OFF-delay without auxillary voltage, 1 CO contact	
3RA2815-.FW10 OFF-delay without auxillary voltage, 1 NC contact/ 1 NO contact	

3RT29 accessories are intended to be used only with 3RT2 or 3RH2 base devices.
3RT19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

Circuit diagrams

Size S00 to S0
Main circuit

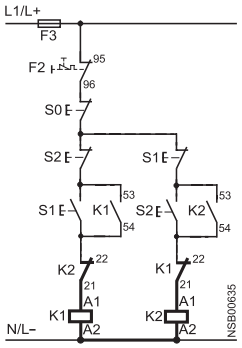


The 3RA2913-2AA. (S00) and 3RA2913-2AA (S0) installation kit contains wiring connectors for connecting the main conducting paths, the mechanical interlock and two connecting clips for the contactors.

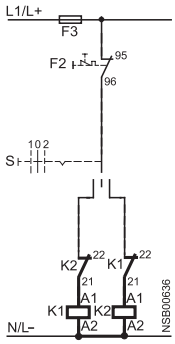
Control circuit (sizes S00 and S0)

(terminal designations of contactors according to EN 50 012)

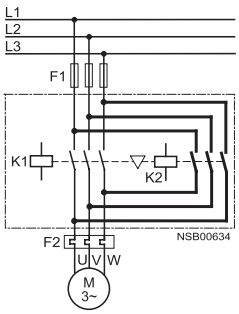
for momentary-contact operation



for maintained-contact operation



Sizes S2 to S3
Main circuit

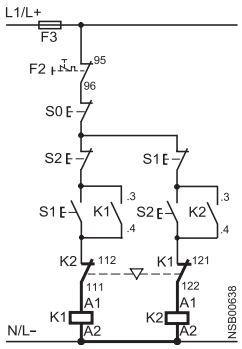


The 3RA19 .3-2A installation kits contain, among other things, the wiring connectors on the top and bottom for connecting the main conducting paths.

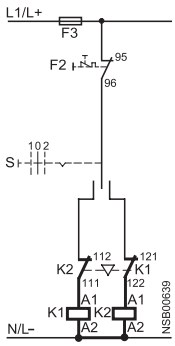
Control circuit

(terminal designations of contactors according to EN 50 005)

for momentary-contact operation



for maintained-contact operation



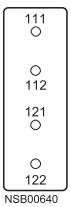
The 3RA19 24-2B mechanical interlock contains one NC contact for the NC contact interlock for each contactor

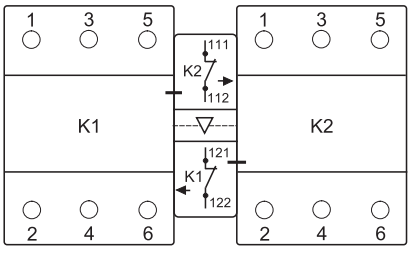
Position of terminals

Sizes S2 to S3
Terminal designations according to EN 50 005

3RA19 24-2B mechanical interlock (laterally mountable), integrated in reversing contactor assemblies (reversing starters),
contains one NC contact for the electrical interlock for each contactor

2 NC





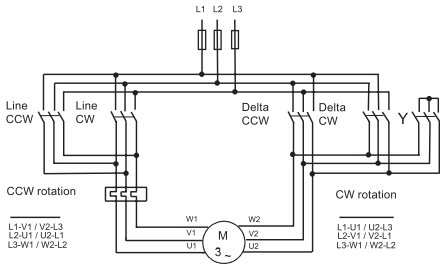
S0 "OFF" button
S1 "Clockwise ON" button
S2 "Counterclockwise ON" button
S "CW-OFF-CCW" button

K1 Clockwise contactor
K2 Counterclockwise contactor

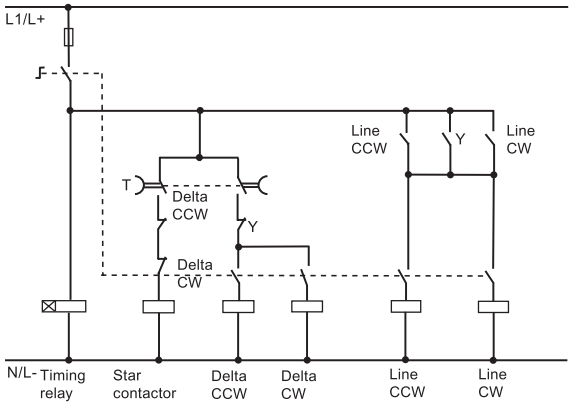
F1 Fuses for main circuit
F3 Fuses for control circuit
F2 Overload relay

Circuit diagrams

Size S00 / S0
Main circuit

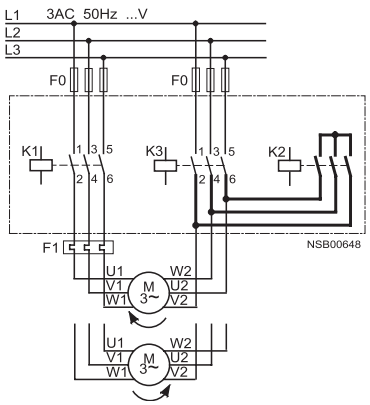


Control circuits
with 3RA2816-0EW20 function module (set of three)
snapped onto the front



Sizes S2 to S3
Main circuit

Sizes S2 and S3

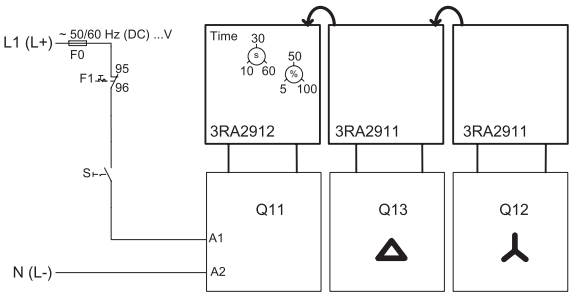


S0 "OFF" button
S1 "ON" button
S Maintained-contact switch

K1 Line contactor
K2 Star contactor
K3 Delta contactor
K4 Solid-state, time-delay auxiliary switch block or time-delay relay

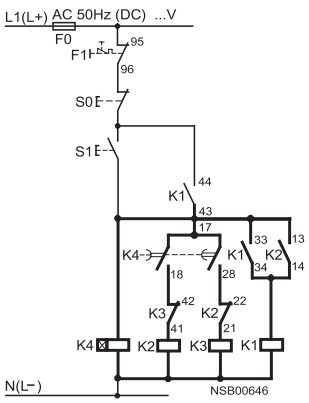
F0 Fuses
F1 Overload relay

3RA2816-0EW20

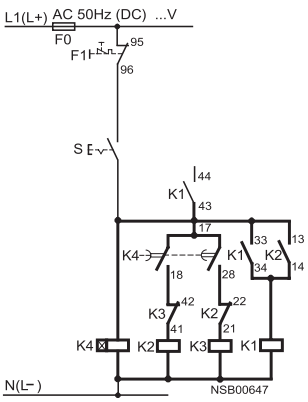


Control circuits
with 3RP15 7. time-delay relay,
laterally mounted (typical circuits)

for momentary-contact operation



for maintained-contact operation

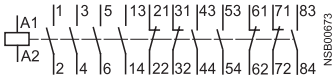


Contact element 17/18 is only closed on the star step; the contact element is open on the delta step and when de-energized.

Internal circuit diagrams

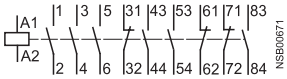
3TF68 44 and 3TF69 44 contactors

4 NO + 4 NC
AC operation
max. complement of auxiliary switches



3TF68 33 and 3TF69 33 contactors

3 NO + 3 NC
DC operation
max. complement of auxiliary switches



Auxiliary switch blocks 3TY7 681-1G
for coil reconnection, 3TF68 and 3TF69, DC economy circuit

Auxiliary switch blocks 3TY7 561-1AA00
first auxiliary switch block left or right

mounted on left

mounted on right

Auxiliary switch blocks 3TY7 561-1KA00
second auxiliary switch block left or right

mounted on left

mounted on right

Auxiliary switch blocks 3TY7 561-1EA00
with make-before-break contacts

mounted on left

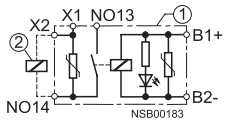
mounted on right

Auxiliary switch blocks 3TY7 561-1.
solid-state compatible aux. switch block

mounted on left

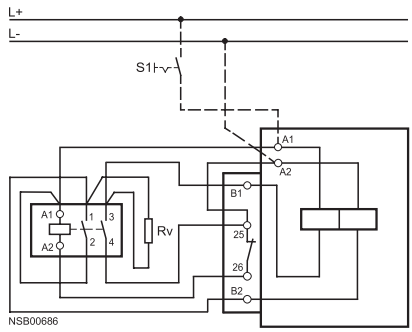
mounted on right

Interface for control by PLC 3TX7 090-0D
with surge suppression



Circuit diagrams for DC economy circuit · maintained-contact operation

3TF68 33 and 3TF69 33 contactors



Terminal designations according to EN 50 012.

Terminal diagrams

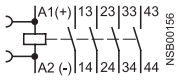
DC operation

L+ is to be connected to coil terminal A1.

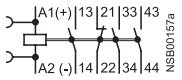
3RH21 coupling relays for auxiliary circuits, size S00
Terminal designations according to EN 50 011
(it is not possible to snap on an auxiliary switch block)

Surge suppressor can be mounted

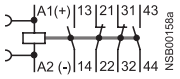
4 NO
Ident no.: 40E



3 NO + 1 NC
31E

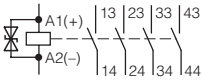


2 NO + 2 NC
22E

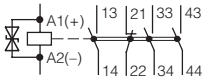


Suppressor Diode integrate

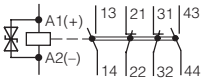
4 NO
Ident no.:40E



3 NO + 1 NC
31E

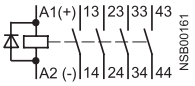


2 NO + 2 NC
22E

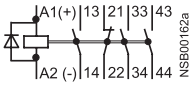


Diode integrated

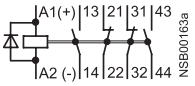
4 NO
Ident no.:40E



3 NO + 1 NC
31E



2 NO + 2 NC
22E

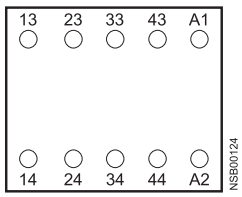


Position of terminals

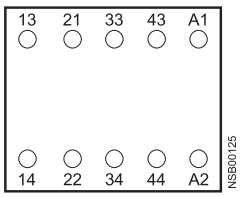
Size S00

3RH21 coupling relays

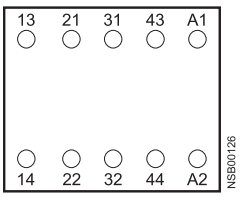
4 NO
Ident no.: 40E



3 NO + 1 NC
31E

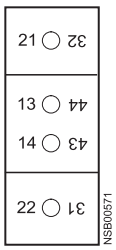


2 NO + 2 NC
22E

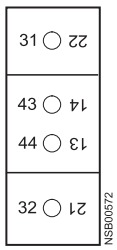


3RH19 21-. DA11 first laterally mountable auxiliary switch block [1]
mountable on left or right

1 NO + 1 NC
left

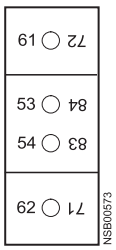


right

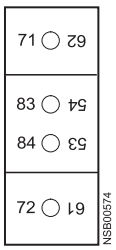


3RH19 21-. JA11 second laterally mountable auxiliary switch block [1]
mountable on left or right
(only for sizes S3 to S12)

1 NO + 1 NC
left



right

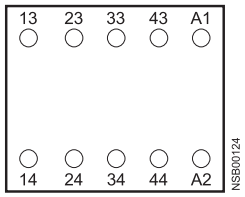


1) Note the location digit.
Can only be used if no 4-pole auxiliary switch block is snapped onto the front.

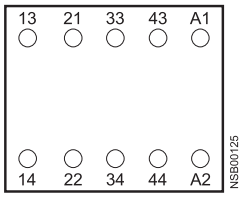
Terminal designations according to EN 50 011

3RH21 control relays

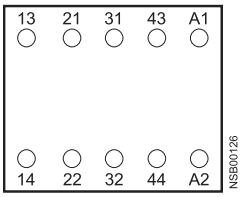
4 NO
Ident no.:40E



3 NO + 1 NC
31E



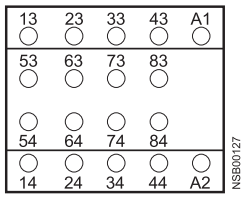
2 NO + 2 NC
22E



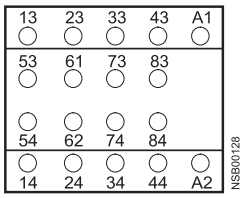
3RH21 40 control relays

with 3RH19 11-1GA.. auxiliary switch blocks snapped onto the front

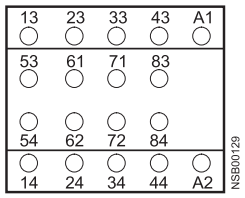
8 NO
Ident no.:80E



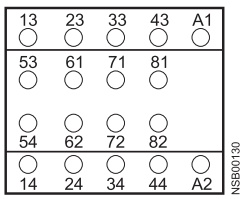
7 NO + 1 NC
71E



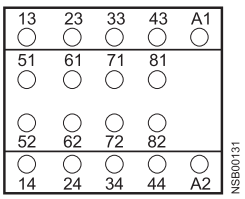
6 NO + 2 NC
62E



5 NO + 3 NC
53E

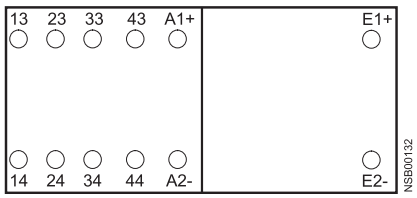


4 NO + 4 NC
Ident no.:44E

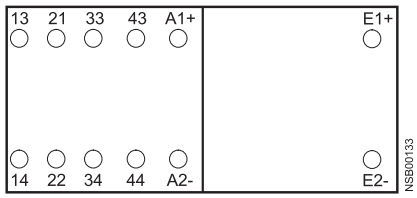


3RH24 latched control relays

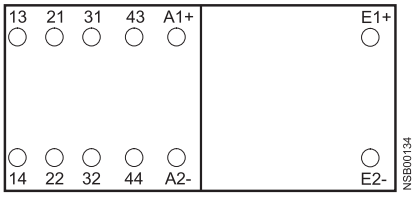
4 NO
Ident no.: 40E



3 NO + 1 NC
31E



2 NO + 2 NC
Ident no.: 22E

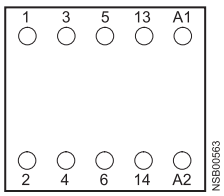


Position of terminals (applicable to screw connection and Cage Clamp connection)

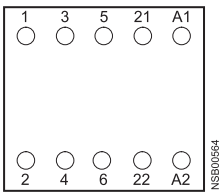
Size S00
Terminal designations according to EN 50 012

3RT20 1 contactors, 3RT20 1 coupling relays,

1 NO
Ident. no. 10E

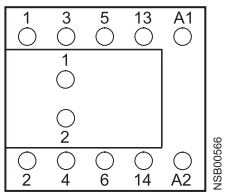


1 NC
01

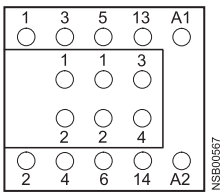


3RT20 1 contactors (with 1 NO)
with auxiliary switch blocks snapped onto the front
3RH19 11-. H . . .

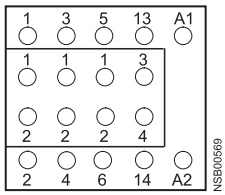
1 NO + 1 NC
Ident. no.: 11



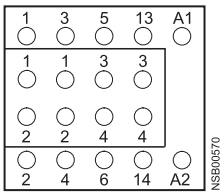
2 NO + 2 NC
22



2 NO + 3 NC
Ident. no.: 23

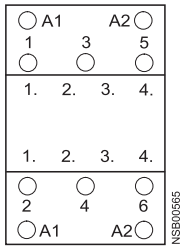


3 NO + 2 NC
32



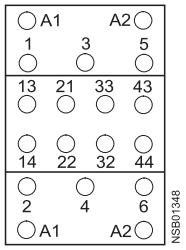
Sizes S3 to S12
Terminal designations according to EN 50 012

3RT 20 3,
3RT20 4, 3RT124 46 contactors,



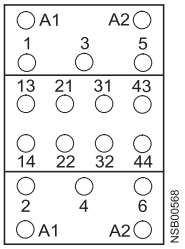
3RT20 3, 3RT20 4 contactors
with 4-pocle auxiliary switch block
for snapping onto the front
3RH19 21-. HA31

3 NO + 1 NC
Ident. no. 31 E



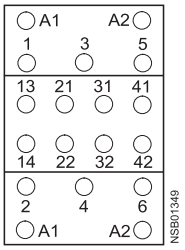
3RT20 3, 3RT20 4 contactors
with 4-pocle auxiliary switch block
for snapping onto the front
3RH19 21-. HA22
4-pole auxiliary switch block
snapped onto the front

2 NO + 2 NC
Ident. no. 22 E



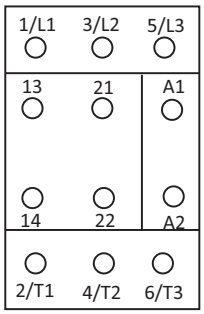
3RT20 3, 3RT20 4 contactors
with 4-pocle auxiliary switch block
for snapping onto the front
3RH19 21-. HA13

1 NO + 3 NC
13 E

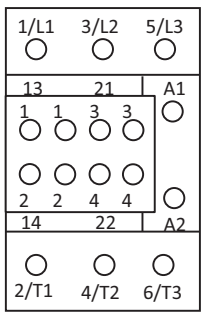


Size S0
Terminal designations according to EN 50 012

3RT20 2 Contactors with 1NO + 1NC
3RT20 2 Coupling Relays

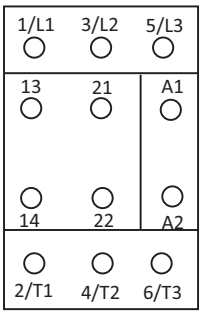


3RT20 2 Contactors with 3NO + 3NC

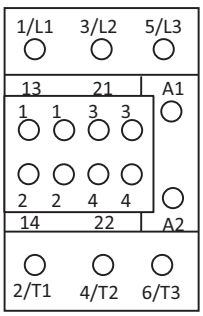


Size S2
Terminal designations according to EN 50 012

3RT20 3 Contactors with 1NO + 1NC
3RT20 3 Coupling Relays



3RT20 3 Contactors with 3NO + 3NC

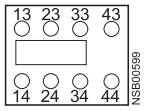


Position of terminals (applicable to screw connection and Spring-type connection)

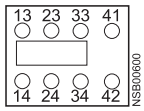
Accessories for size S3 to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-. F... auxiliary switch blocks, 4-pole,
for snapping onto the front

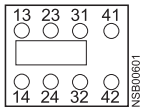
4 NO
Ident. no. 40



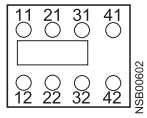
3 NO + 1 NC
31



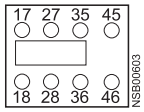
2 NO + 2 NC
22



4 NC
04



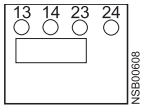
2 NO + 2 NC
22 U



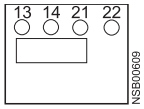
make-before-break

3RH19 21-1LA.. auxiliary switch blocks, 2-pole,
for snapping onto the front, cable entry from above

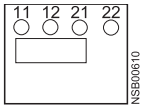
2 NO



1 NO + 1 NC

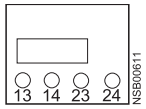


2 NC

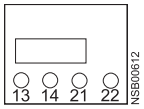


3RH19 21-1MA.. auxiliary switch blocks, 2-pole,
for snapping onto the front, cable entry from below

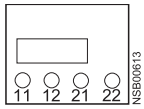
2 NO



1 NO + 1 NC

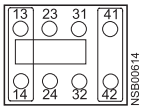


2 NC



3RH19 21-. FE22 solid-state compatible auxiliary switch block, 4-pole,
for snapping onto the front

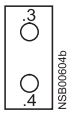
2 NO + 2 NC
Ident. no. 22



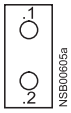
Terminal designations according to EN 50 005 or EN 50 012

3RH19 21-. CA.. auxiliary switch blocks, single-pole,
for snapping onto the front

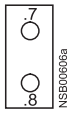
1 NO



1 NC

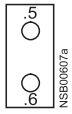


1 NO



with extended
contact-making

1 NC



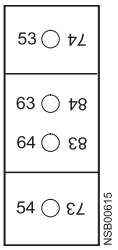
with extended
contact-making

Position of terminals

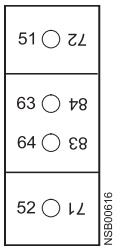
Accessories for size S2 to S12 contactors
Terminal designations acc. to EN 50 005

3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (left)

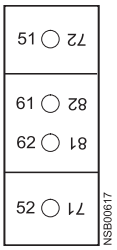
2 NO



1 NO + 1 NC

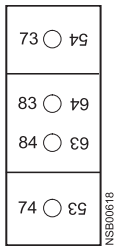


2 NC

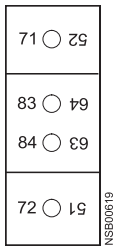


3RH19 21-. EA.. first laterally mountable auxiliary switch blocks (right)

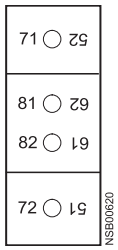
2 NO



1 NO + 1 NC

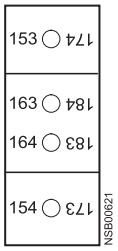


2 NC

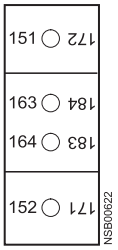


3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (left)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

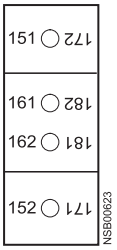
2 NO



1 NO + 1 NC

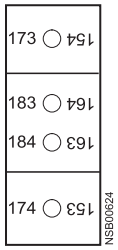


2 NC

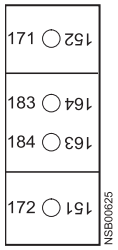


3RH19 21-. KA.. second laterally mountable auxiliary switch blocks (right)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

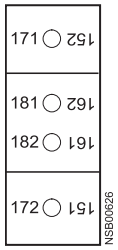
2 NO



1 NO + 1 NC



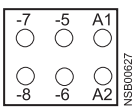
2 NC



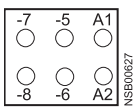
Accessories for size S3 to S12 contactors
Terminal designations acc. to DIN 46 199 Part 5

3RT19 26-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

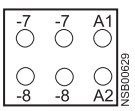
1 NO + 1 NC
ON-delay



1 NO + 1 NC
OFF-delay

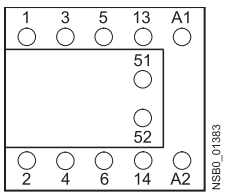


2 NO
Star-delta function



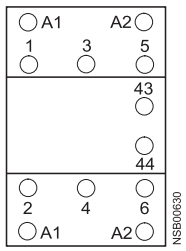
3RT26 capacitor contactors

Size S00
with 4-pole auxiliary switch block mounted on the front



The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.

Sizes S2 and S3
with 4-pole auxiliary switch block mounted on the front



The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.

Position of terminals (applicable to screw connection and Spring-type terminal connection)

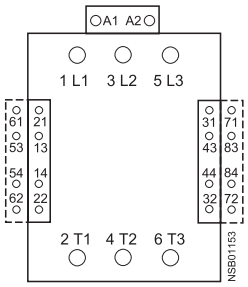
Sizes S6 to S12

3RT1.5, 3RT1.6, 3RT1.7 contactors

- with conventional op. mechanism (3RT1. ..-.**A**...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

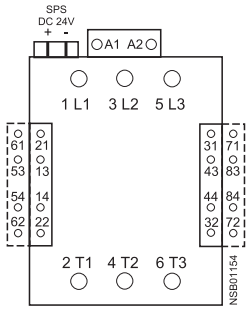
2 NO + 2 NC or 4 NO + 4 NC



- with solid-state op. mechanism (3RT1. ..-.**N**...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

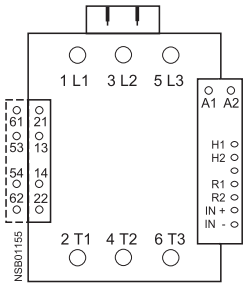
2 NO + 2 NC or 4 NO + 4 NC



- with solid-state op. mechanism (3RT1. ..-.**P**...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 1 NO + 1 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 2 NO + 2 NC)

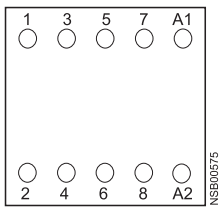
1 NO + 1 NC or 2 NO + 2 NC



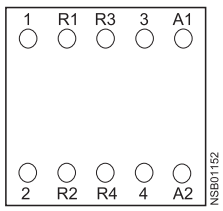
Contactors with 4 main contacts, size S00 Terminal designations acc. to EN 50 005

3RT23 and 3RT25 contactor s

4 NO



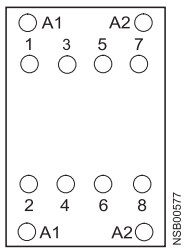
2 NO + 2 NC



Contactors with 4 main contacts, sizes S2 to S3 Terminal designations acc. to EN 50 005

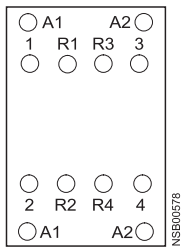
3RT13 and 3RT15 contactors

4 NO



Size S0 with integrated 1NO + 1NC aux (13/14 + 21/22) and only one set of A1+A2 on front

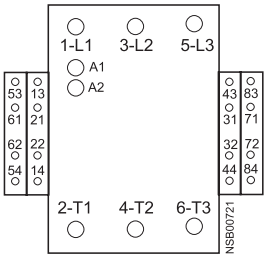
2 NO + 2 NC



Position of terminals

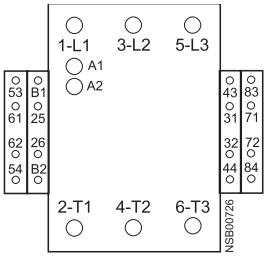
AC operation

3TF68 and 3TF69 contactors
4 NO + 4 NC



DC operation

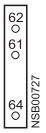
3TF68 and 3TF69 contactors
3 NO + 3 NC
max. complement of auxiliary switches



Solid-state compatible auxiliary switch blocks
3TY7 561-1. for lateral mounting onto size 6 to 14 contactors

mounted on left

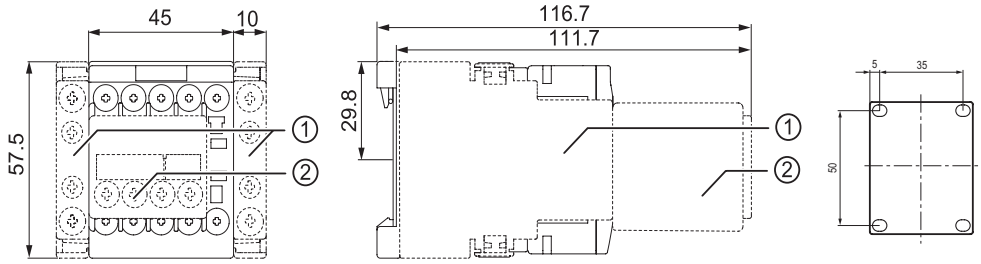
mounted on right



Dimension drawings

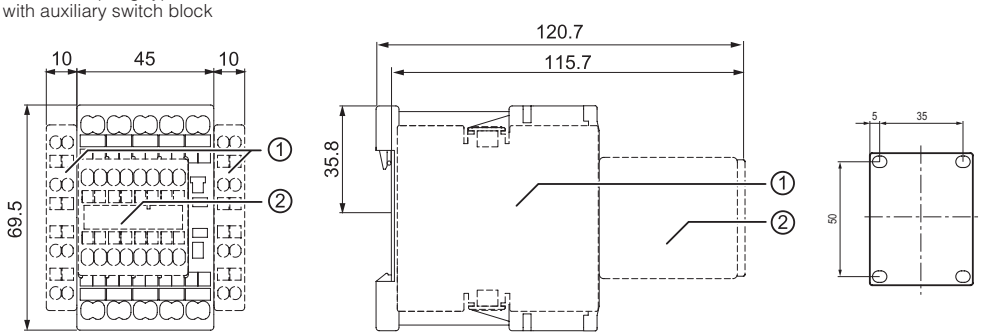
3RT2.1.-1 contactor and 3RH21..-1 contactor relays
Size S00 and NEMA Size 0, screw connection
with surge suppressor and auxiliary switch block

Lateral clearance from earthed parts = 6 mm



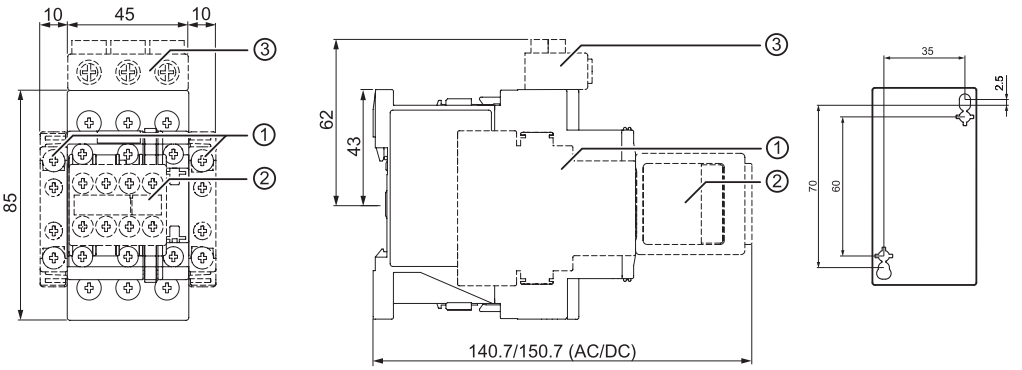
1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

3RT2.1.-2 contactor and 3RH21..-2 contactor relay
Size S00, Spring-type terminal connection
with auxiliary switch block



1) Laterally mountable auxiliary switch block 3RH2911-2DA.. / -2DE.. / -2EE..
2) Auxiliary switch block for mounting on the front 3RH2911-2FA.. / -2GA.. / -2HA.. / -2NF..

3RT2.2.-1 contactors Size S0 and NEMA Size 1,
(screw-type connection system) with auxiliary switch blocks
mounted and other accessories

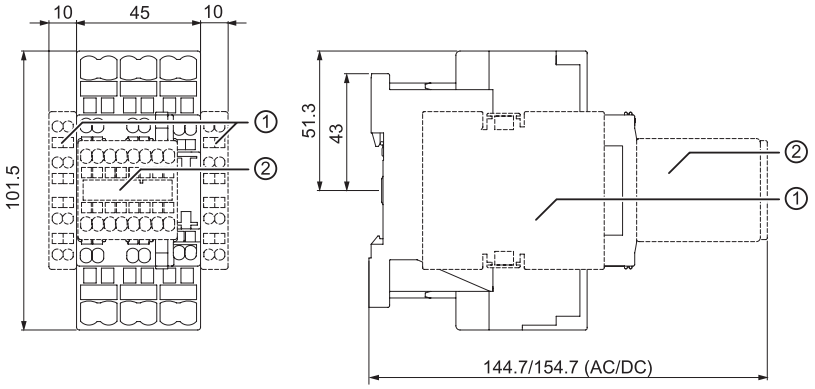


1) Laterally mountable auxiliary switch block 3RH2921-1DA.. / -1DE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..
3) 3-phase infeed terminal 3RV2925-5AB

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

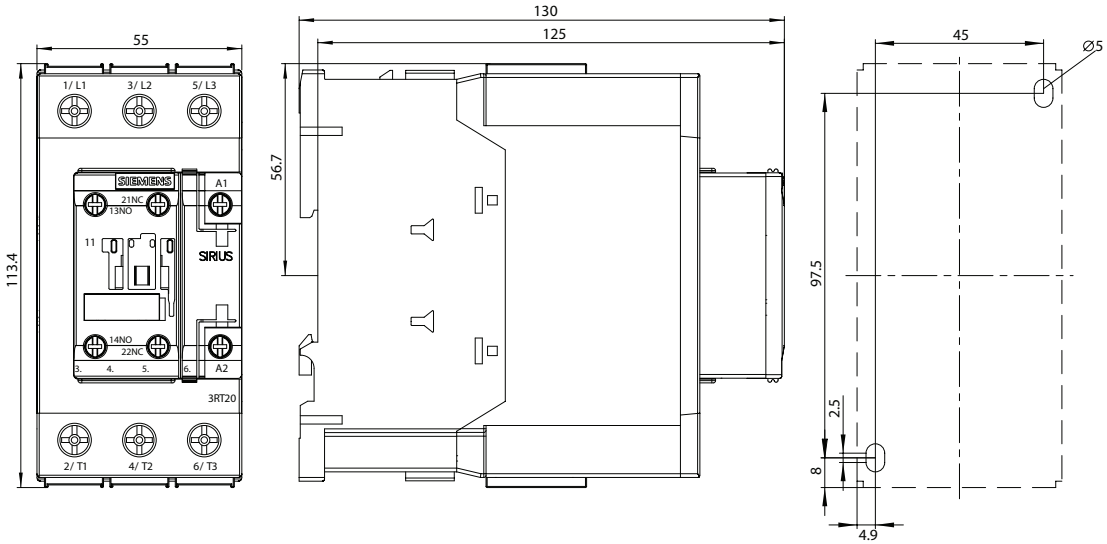
Dimension drawings

3RT2.2.-2 and 3RT202.-.....-0LA2 contactors
Size S0 (spring-loaded connection) with auxiliary switch blocks mounted



For size S0:
1) Laterally mountable auxiliary switch block 3RH2921-2DA.. / -2DE..
2) Auxiliary switch block for mounting on the front 3RH2911-2FA.. / -2GA.. / -2HA.. / -2NF..

3RT20 3 contactors
Size S2 and NEMA Size 2, screw connection
with surge suppressor, auxiliary switch blocks and mounted overload relay



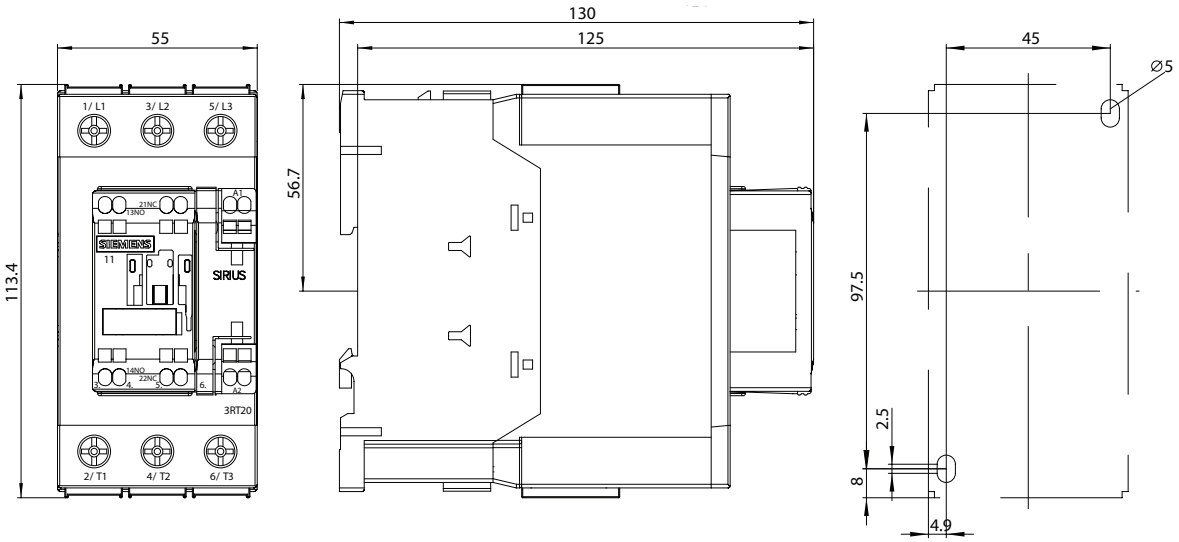
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

For size S2:
a = 0 mm with varistor < 240 V, diode assembly
a = 3.5 mm with varistor > 240 V
a = 17 mm with RC element
b = DC 15 mm deeper than AC

1) Auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
3) Surge suppressor
4) Drilling pattern

Dimension drawings

3RT20 3 contactors
Size S2, Spring-type terminal connection
with surge suppressor, auxiliary switch blocks and mounted overload relay



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

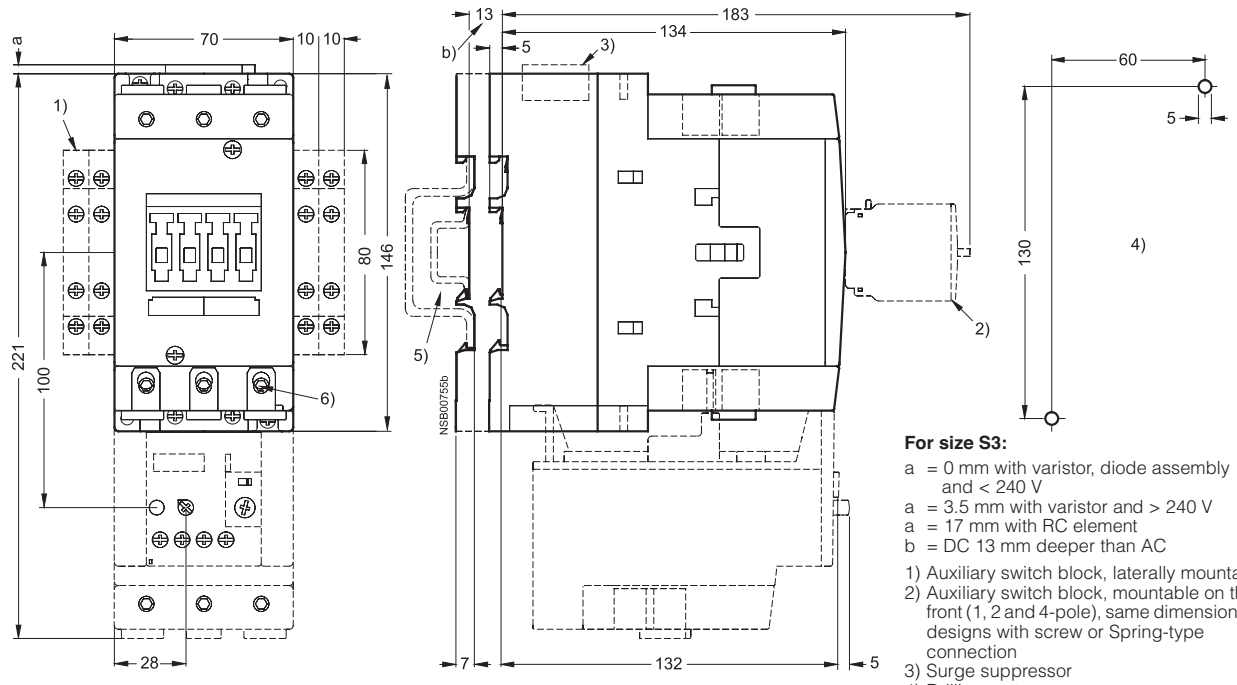
For size S2:

a = 0 mm with varistor < 240 V, diode assembly
a = 3.5 mm with varistor > 240 V
a = 17 mm with RC element
b = DC 15 mm deeper than AC

1) Auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
3) Surge suppressor
4) Drilling pattern

3RT20 4, 3RT24 46 contactors
Size S3 and NEMA Size 3, screw connection
with surge suppressor, auxiliary switch blocks and mounted overload relay

Lateral clearance from earthed parts = 6 mm



For size S3:

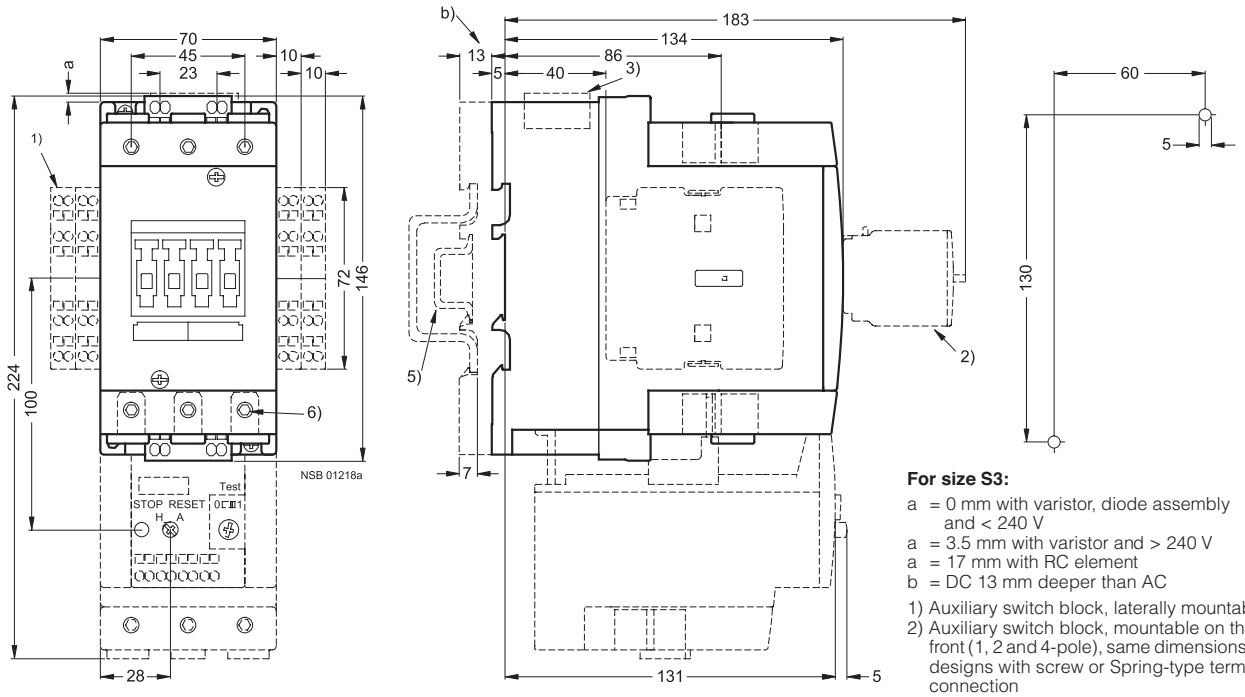
a = 0 mm with varistor, diode assembly and < 240 V
a = 3.5 mm with varistor and > 240 V
a = 17 mm with RC element
b = DC 13 mm deeper than AC

1) Auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole), same dimensions for designs with screw or Spring-type connection
3) Surge suppressor
4) Drilling pattern
5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50 023
6) Hexagon socket screw 4 mm

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

3RT20 4 contactors,
Size S3, Spring-type terminal connection with surge suppressor, auxiliary switch blocks and mounted overload relay



For size S3:

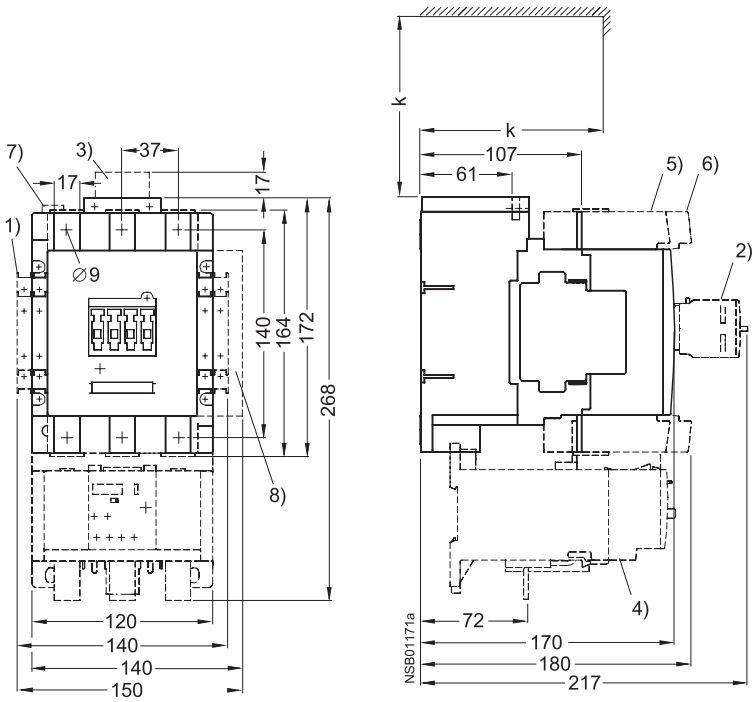
a = 0 mm with varistor, diode assembly and < 240 V
a = 3.5 mm with varistor and > 240 V
a = 17 mm with RC element
b = DC 13 mm deeper than AC

1) Auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole), same dimensions for designs with screw or Spring-type terminal connection
3) Surge suppressor
4) Drilling pattern
5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50 023
6) Hexagon socket screw 4 mm

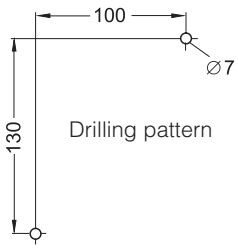
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

3RT10 5, 3RT14 5 contactors
Size S6 and NEMA Size 4
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



Clearance from earthed parts with
directly mounted overload relay:
lateral: 10 mm
front: 20 mm



For size S6:

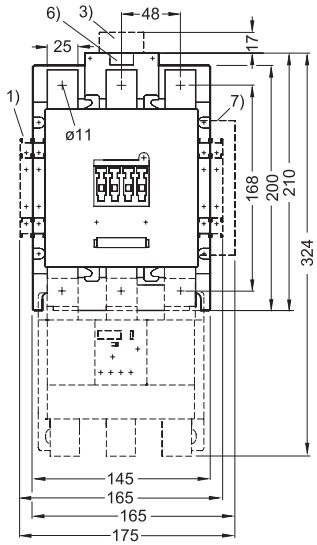
k = 120 mm (minimum clearance for removing the withdrawable coil)

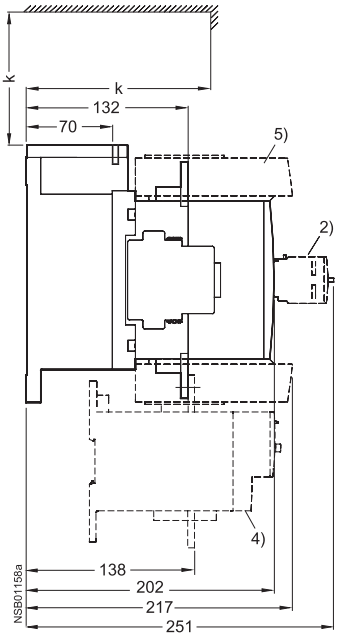
1) Second auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front
3) RC element
4) 3RB10 overload relay, mounted
5) 3RT19 55-4G box terminal block (hexagon socket 4 mm)
6) 3RT19 56-4G box terminal block (hexagon socket 4 mm)
7) PLC connection DC 24 V and changeover switch (with 3RT1…-.N)
8) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

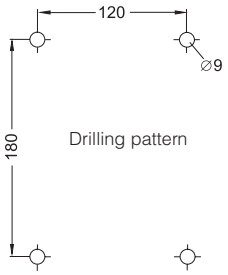
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

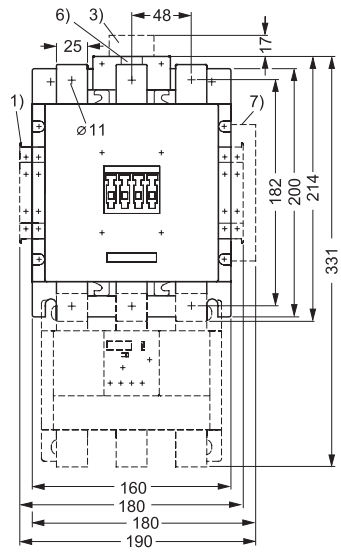
3RT10 6, 3RT14 6 contactors
Size S10
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication

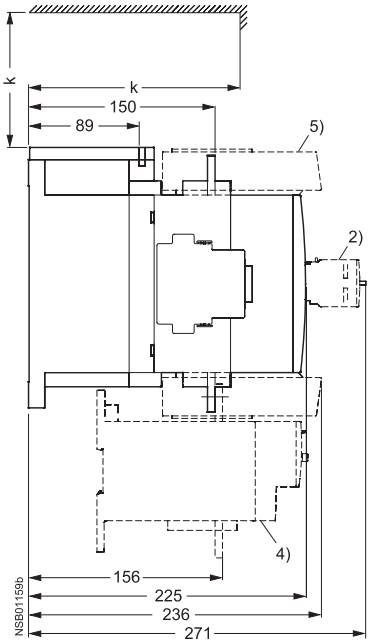


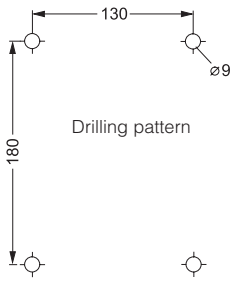




3RT10 7, 3RT14 7 contactors
Size S12
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication







For sizes S10 and S12:
Clearance from earthed parts with directly mounted overload relay:
lateral: 10 mm
front: 20 mm

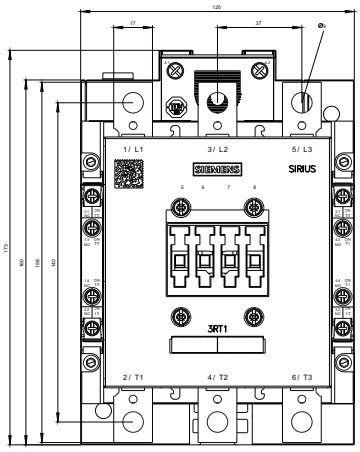
For sizes S10 and S12:
k = 150 mm (minimum clearance for removing the withdrawable coil)

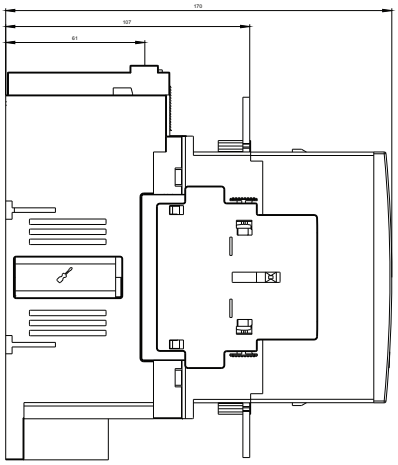
1) Second auxiliary switch block, laterally mountable
2) Auxiliary switch block, mountable on the front
3) RC element
4) 3RB10 overload relay, mounted
5) Box terminal block (hexagon socket 6 mm)
6) PLC connection DC 24 V and changeover switch (with 3RT1…-.N)
7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

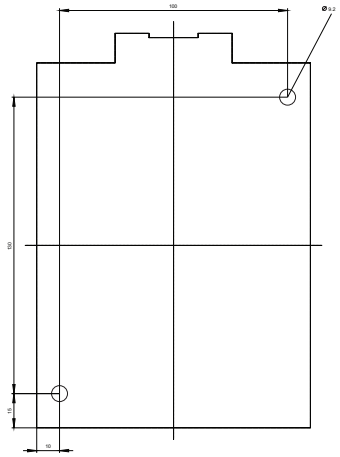
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

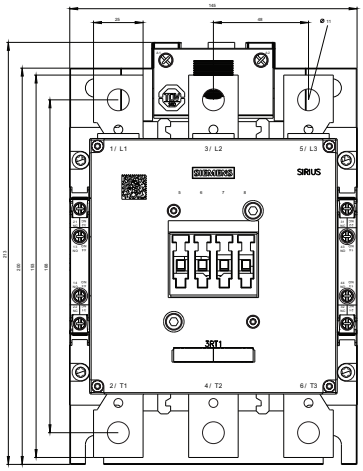
3RT10 contactors with integrated safety
Size S6

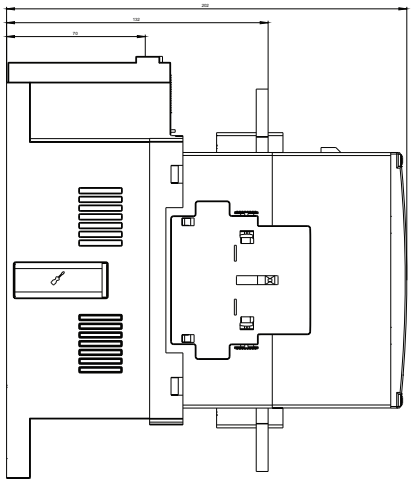


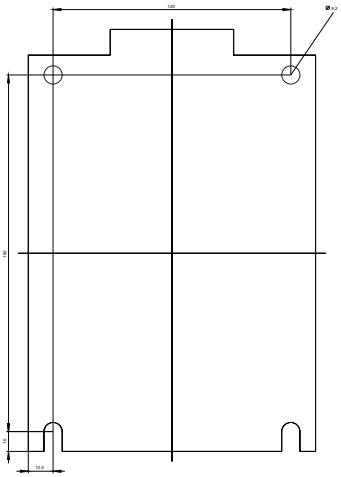




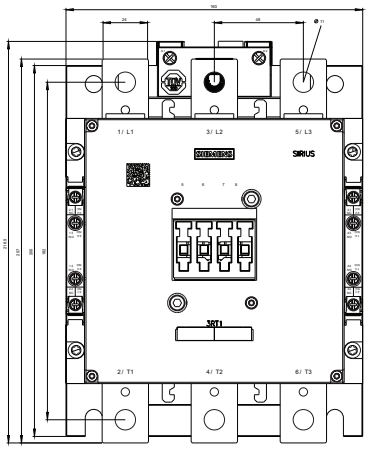
Size S10

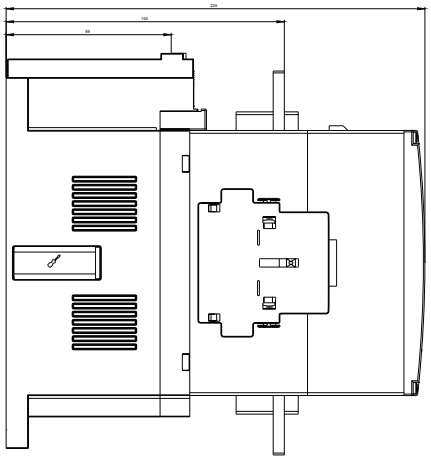


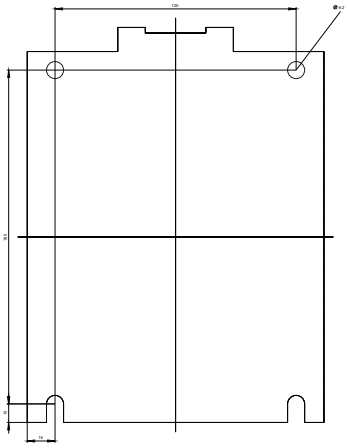




Size S12

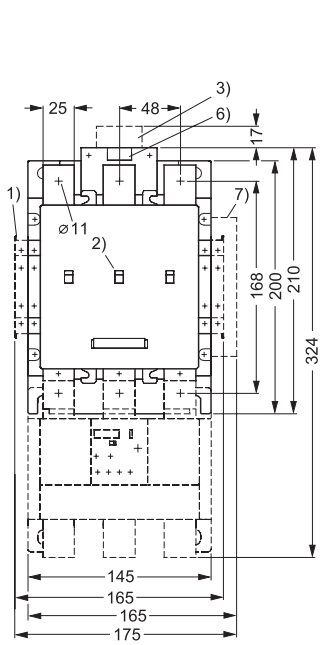


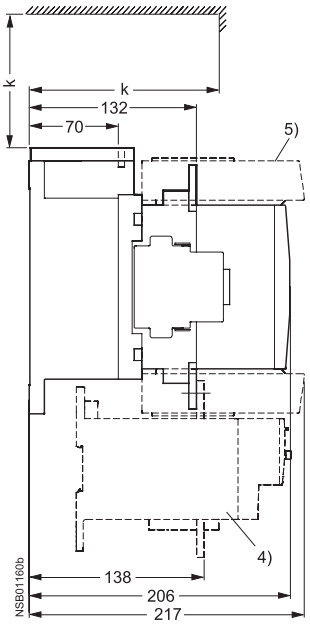


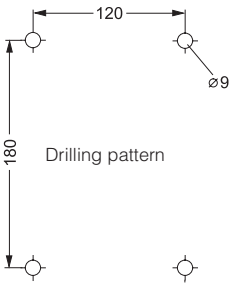


Dimension drawings

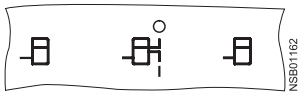
3RT12 6 vacuum contactors
Size S10
with auxiliary switch block, laterally mountable,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



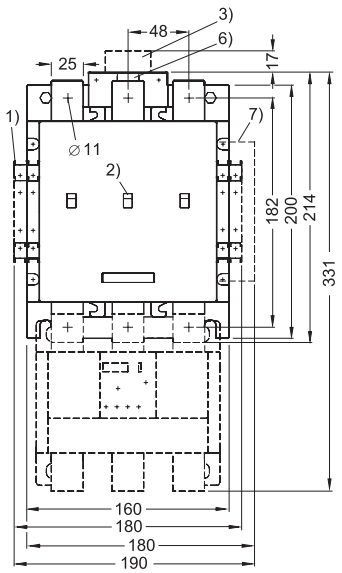


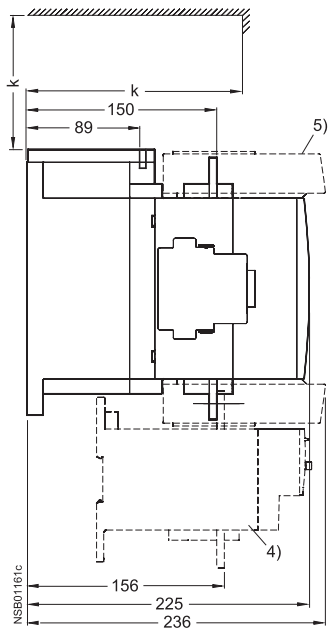


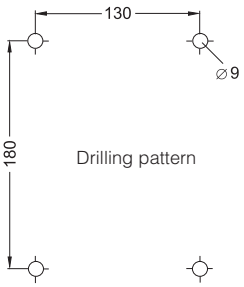
Detail
Contact erosion indicator for vacuum interrupters



3RT12 7 vacuum contactors
Size S12
with auxiliary switch block, laterally mountable,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication







For sizes S10 and S12:

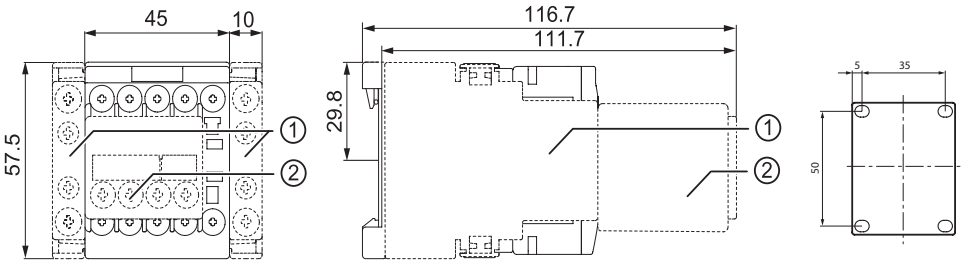
k = 150 mm (minimum clearance for removing the withdrawable coil)

1) Second auxiliary switch block, laterally mountable
2) Position and contact erosion indicator
3) RC element
4) 3RB10 overload relay, mounted
5) Box terminal block (hexagon socket 6 mm)
6) PLC connection DC 24 V and changeover switch (with 3RT1…-.N)
7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

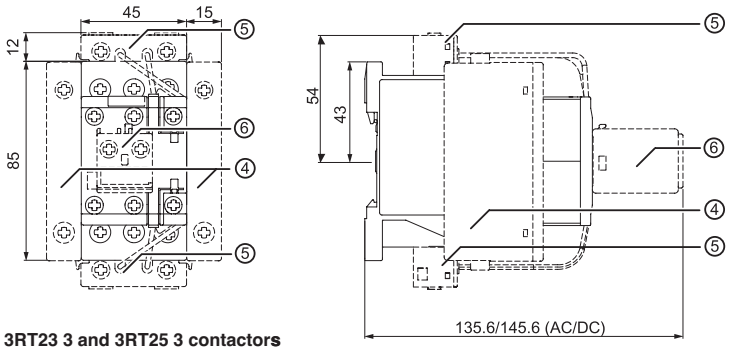
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

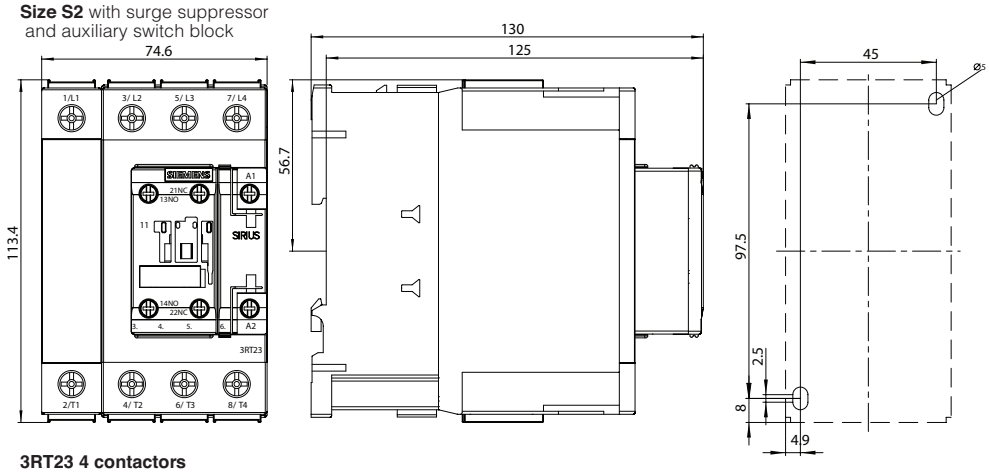
3RT23 1 and 3RT25 1 contactors
Size S00, screw connection
with surge suppressor and auxiliary switch block



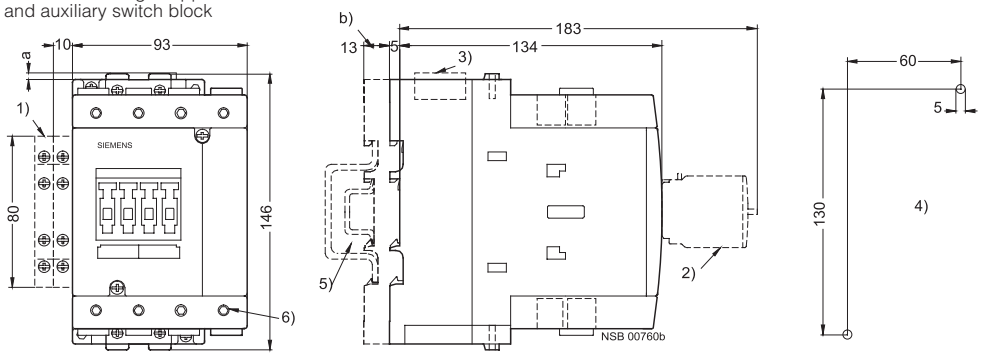
3RT23 2 and 3RT25 2 contactors
Size S0 with coil terminal module
and auxiliary switch block



3RT23 3 and 3RT25 3 contactors
Size S2 with surge suppressor
and auxiliary switch block



3RT23 4 contactors
Size S3 with surge suppressor
and auxiliary switch block



Lateral clearance from earthed parts = 6 mm

For size S00:
1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

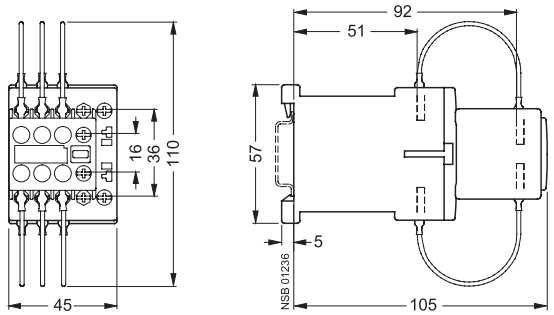
For size S0:
4) 4-pole contactor for switching 4 resistive loads 3RT232. 4-pole pole-changing contactor for changing the polarity of hoisting gear motors (2 NO contacts and 2 NC contacts) 3RT252.
5) Coil terminal module 3RT2926-4RA11/-4RB11
6) Auxiliary switch block for mounting on the front 3RH2911-1AA.. / -1BA

For sizes S2 and S3:
a = 0 mm with varistor < 240 V
a = 3.5 mm with varistor > 240 V
a = 17 mm with RC element and diode assembly
b = S2: DC 15 mm deeper than AC
S3: DC 13 mm deeper than AC
1) Auxiliary switch block, laterally mountable (right or left)
2) Auxiliary switch block, mountable on the front, (1, 2 and 4-pole, also 3RH19 21-1FE22 solid-state compatible design)
3) Surge suppressor
4) Drilling pattern
5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or, in the case of size S3, 75mm standard mounting rail acc. to EN 50 023
6) Hexagon socket screw 4 mm

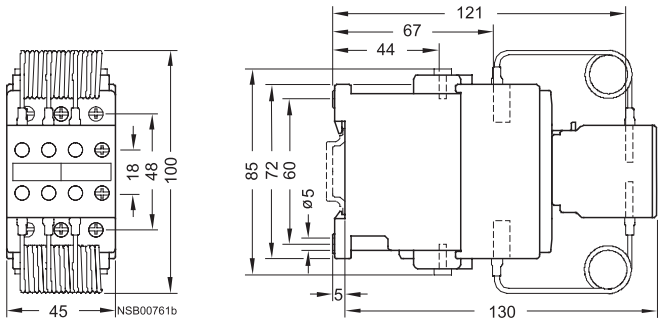
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

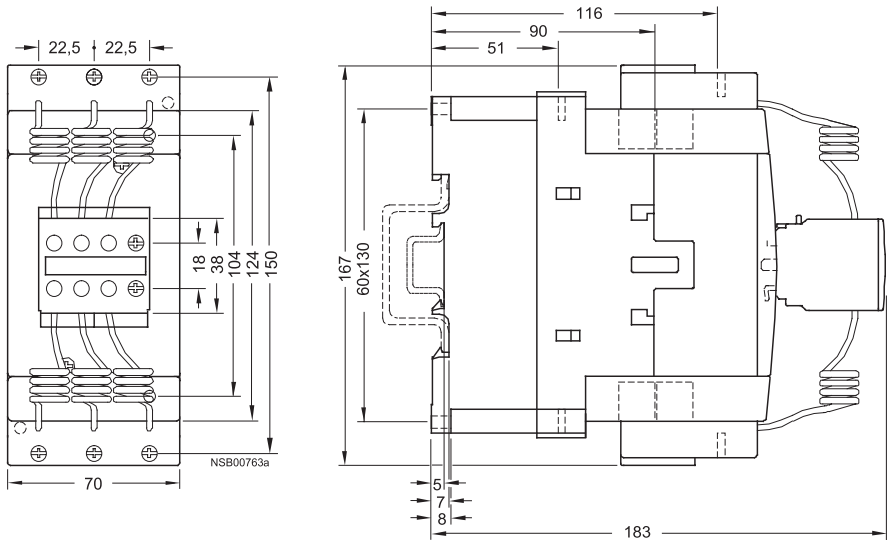
3RT16 17 capacitor contactors
Size S00



3RT16 27 capacitor contactors
Size S0



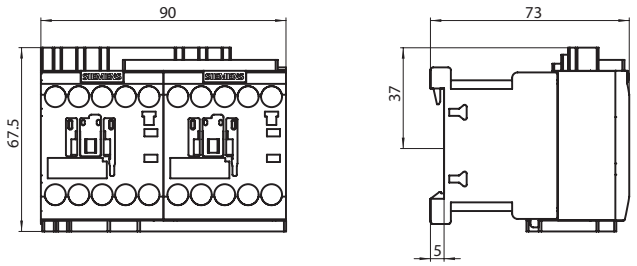
3RT16 47 capacitor contactors
Size S3



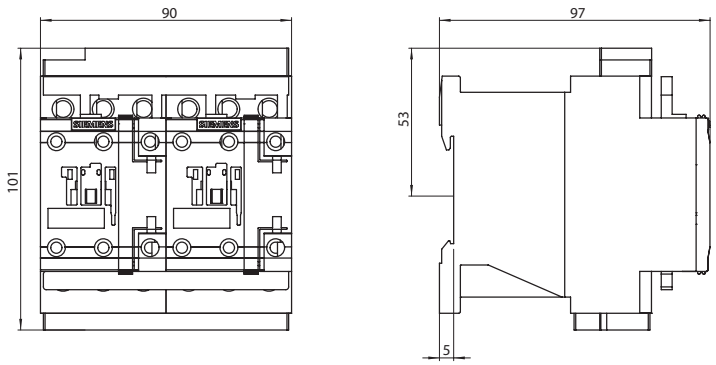
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

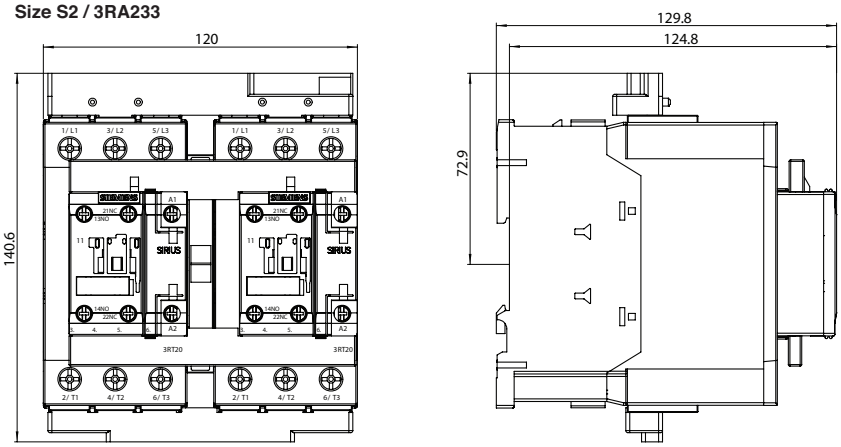
Size S00 / 3RA231



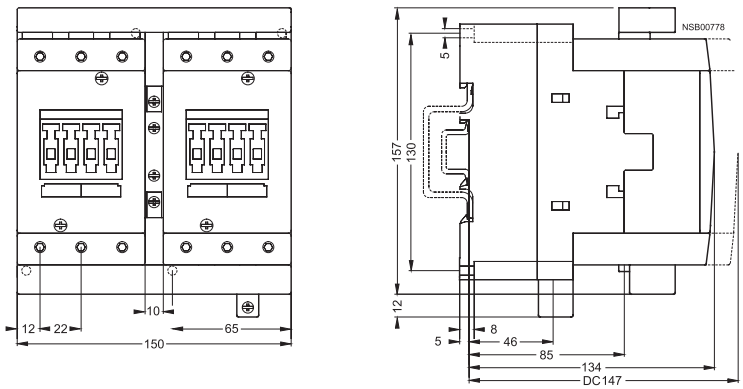
Size S0 / 3RA232



Size S2 / 3RA233



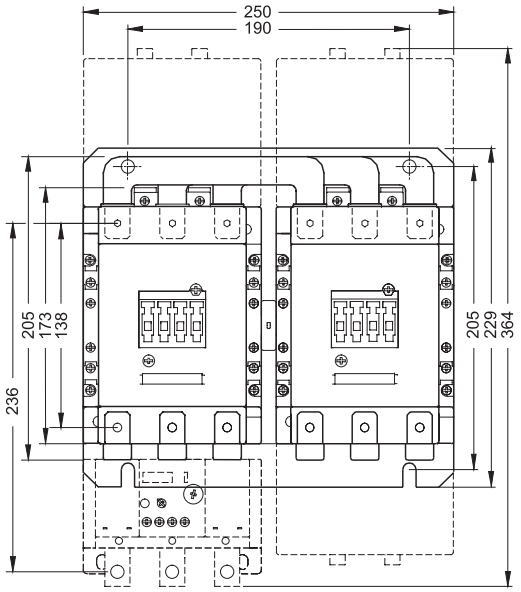
Size S3 / 3RA234

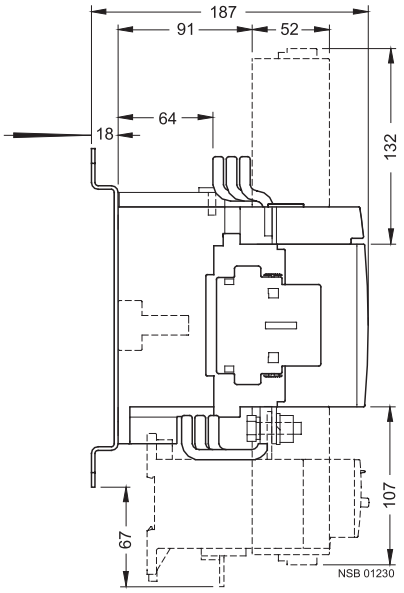


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

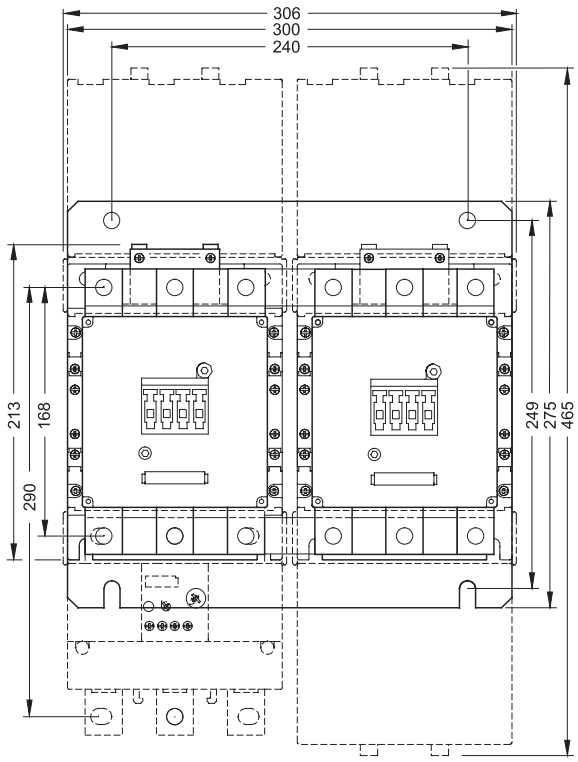
Dimension drawings

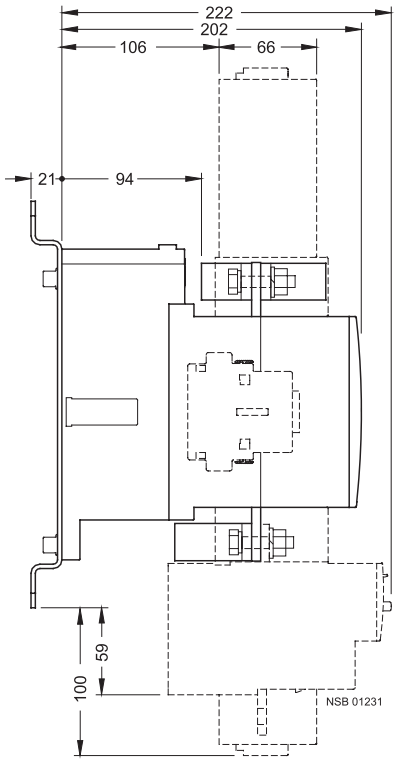
Size S6





Size S10

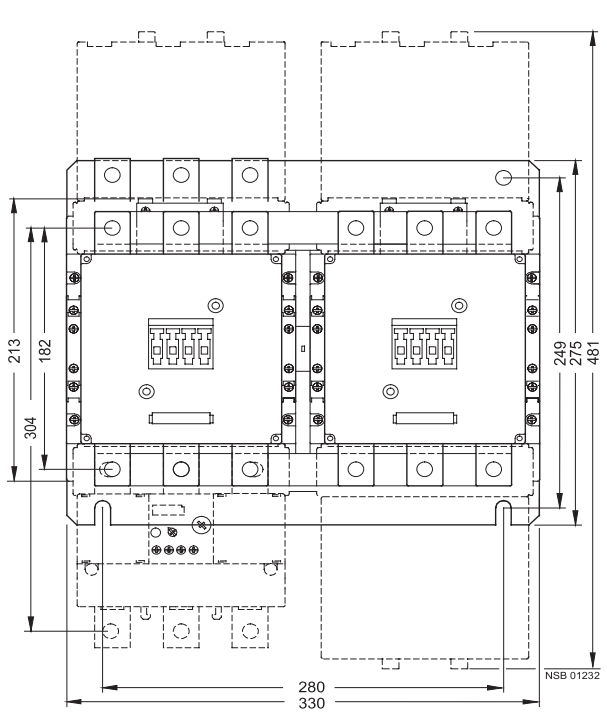


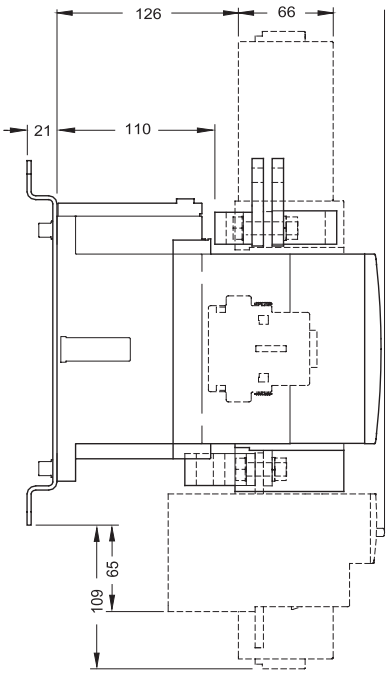


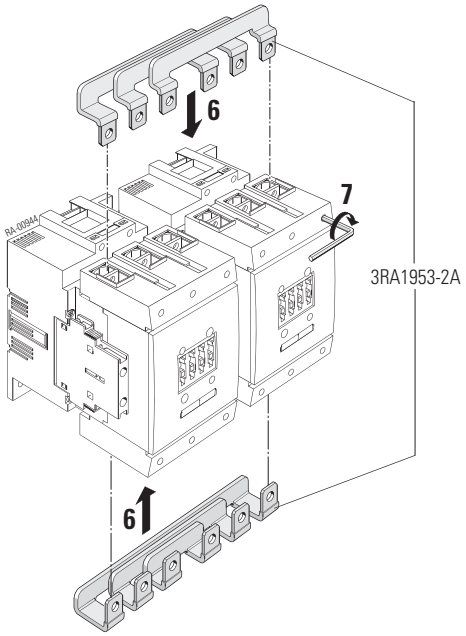
The assemblies shown on this page are for customer assembly with individual components.

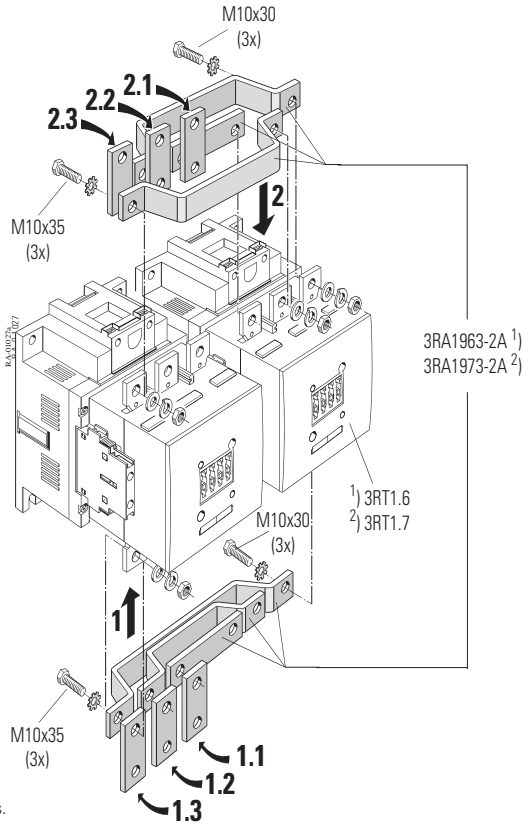
Dimension drawings

Size S12





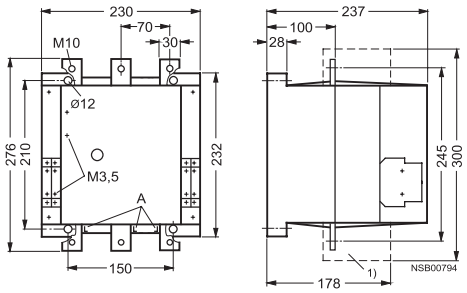




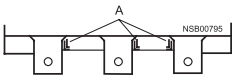
The assemblies shown on this page are for customer assembly with individual components.

Dimension drawings

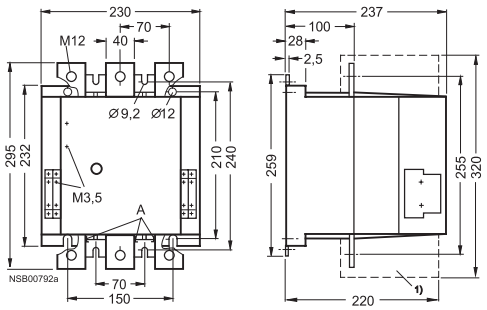
3TF68 vacuum contactors



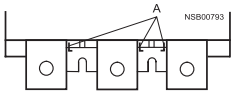
Detail
A = Contact erosion indicator for vacuum interrupter contacts



3TF69 vacuum contactors

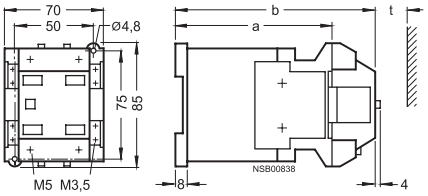


Detail
A = Contact erosion indicator for vacuum interrupter contacts



3TC4 and 3TC5 contactors

3TC44 contactors
Size 2, AC and DC operation

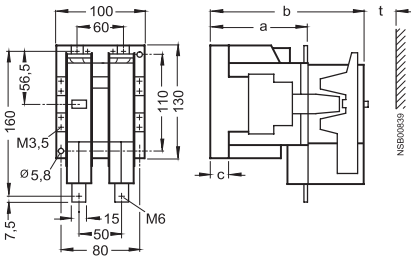


t = minimum clearance from insulated components: 15 mm (600 V and 750 V)

from grounded components: 30 mm (600 V and 750 V)

	a	b
DC operation	109	141
AC operation	68	100

3TC48 contactors
Size 4, AC and DC operation

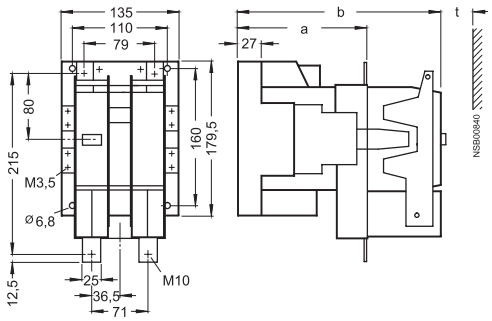


t = minimum clearance from insulated components: 15 mm (600 V), 20 mm (750 V)

from grounded components: 35 mm (600 V), 55 mm (750 V)

	a	b	c
DC operation	112	180	21.5
AC operation	86	154	23.5

3TC52 contactors
Size 8, AC and DC operation

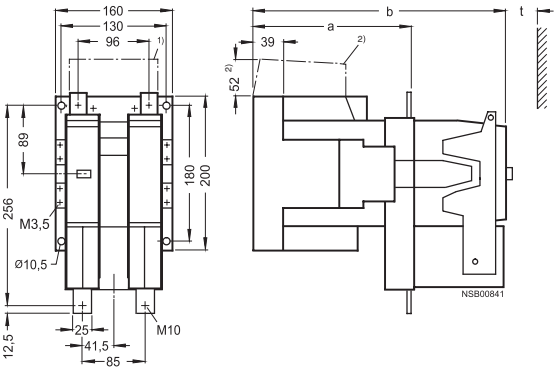


t = minimum clearance from insulated components: 20 mm (600 V and 750 V)

from grounded components: 70 mm (600 V and 750 V)

	a	b
DC operation	147	232
AC operation	115	200

3TC56 contactors
Size 12, AC and DC operation



t = minimum clearance from insulated components: 25 mm (600 V and 750 V)

from grounded components: 80 mm (600 V), 100 mm (750 V)

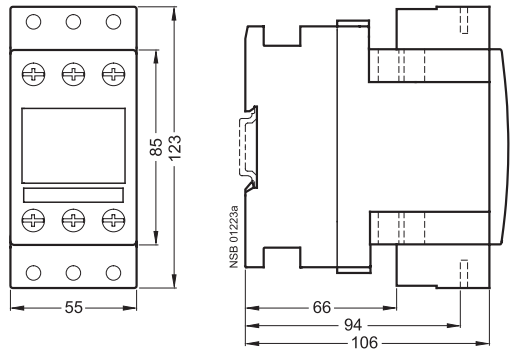
	a	b
DC operation	200	310
AC operation	141	251

1) With box terminals for laminated copper bars (accessories).

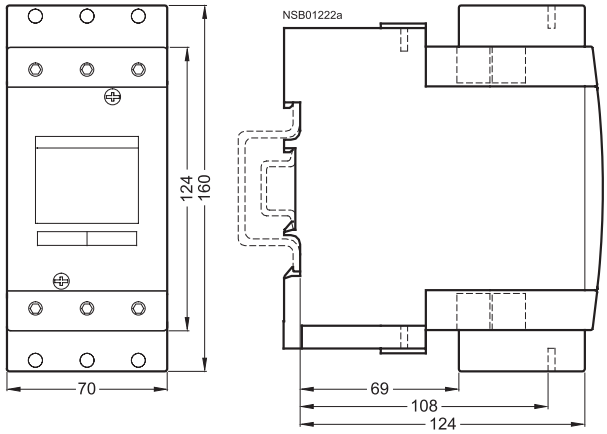
2) DC operation only

Dimension drawings

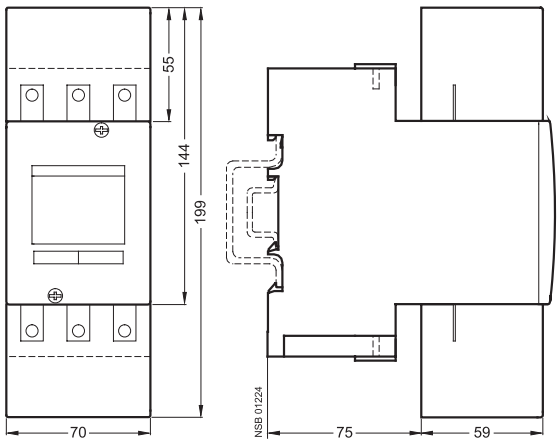
Terminal cover for box terminals for size S2, 3RT29 36-4EA2



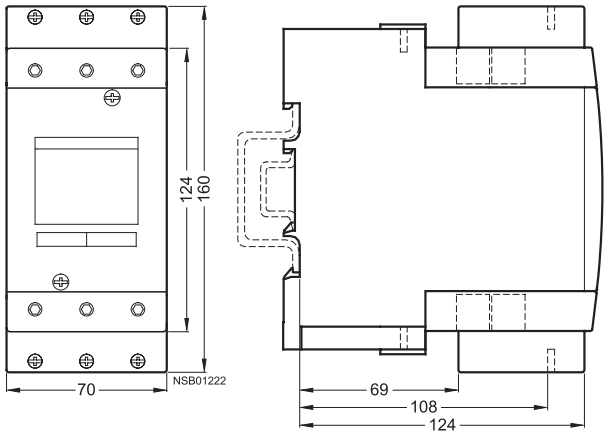
Terminal cover for box terminals for size S3, 3RT19 46-4EA2



Terminal cover for cable lug and bar connection for size S3, 3RT19 46-4EA1



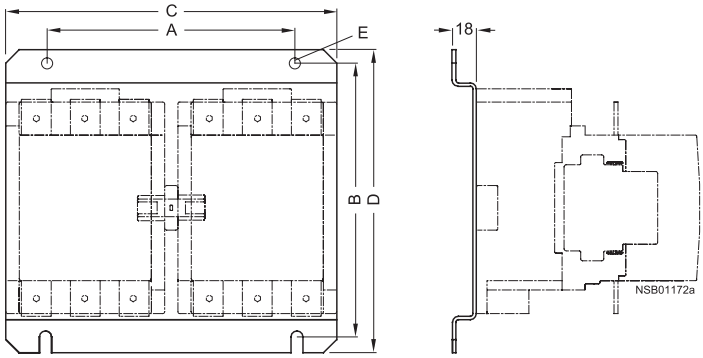
Auxiliary conductor terminal, 3-pole 3RT19 46-4F Size S3
mounted on contactor



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

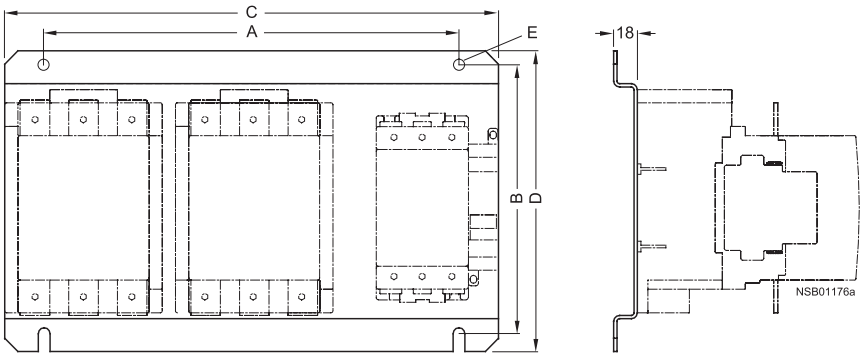
Dimension drawings

3RA19.2-2A baseplates for reversing contactor assemblies



	A	B	C	D	E
S6	190	205	250	229	9
S10	240	249	300	275	11
S12	280	249	330	275	11

3RA19.2-2E, 3RA19.2-2F
baseplates for star-delta assemblies

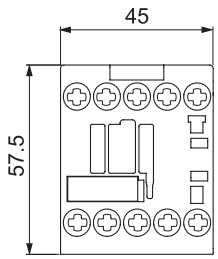


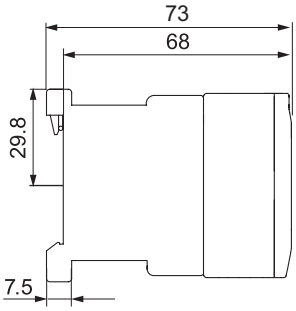
	A	B	C	D	E
S6-S6-S3	316	205	376	229	9
S6-S6-S6	343	205	403	229	9
S10-S10-S6	393	250	453	275	11
S10-S10-S10	423	250	483	275	11
S12-S12-S10	450	250	510	275	11
S12-S12-S12	465	250	525	275	11

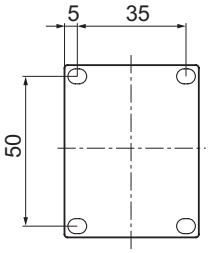
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

3RH21 control relays
Size S00, with screw connections

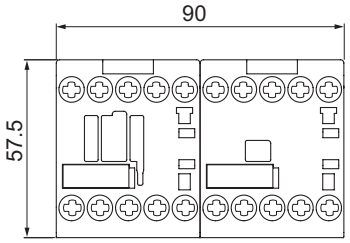


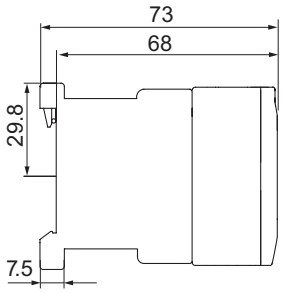




Lateral clearance from earthed parts = 6 mm

3RH24 latched control relays
Size S00

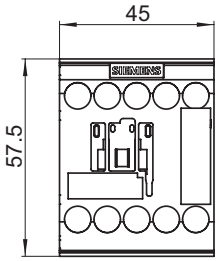


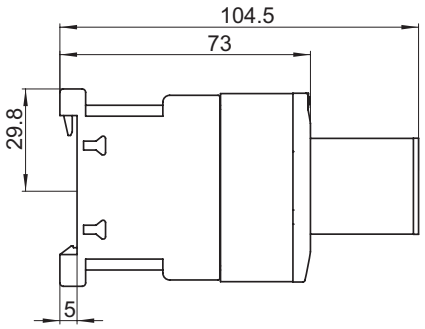


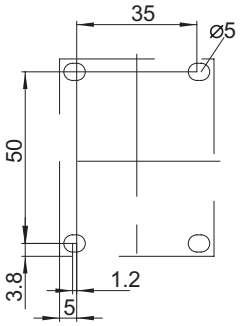
3RH21 coupling relay

Dimension drawings

Size S00, with screw connections,
with surge suppressor







1) Surge suppressor
2) Drilling pattern

Deviating dimensions for coupling relays with Spring-type terminal connections

Height: 69.5 mm

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax